SURVEY OF COMPOUNDS WHICH HAVE BEEN TESTED FOR CARCINOGENIC ACTIVITY

SUPPLEMENT 1

U. S. DEPARTMENT OF HEALTH, EDUCATION, AND WELFARE
Public Health Service

Library
National Institutes of Health
Bethesda 14, Maryland

LIBRARY
JAN 14 1958
NATIONAL INSTITUTES OF HEALTH

U.S. DEPARTMENT OF HEALTH, EDUCATION, AND WELFARE
PUBLIC HEALTH SERVICE

SURVEY OF COMPOUNDS WHICH HAVE BEEN TESTED FOR CARCINOGENIC ACTIVITY

Supplement 1

By
Philippe Shubik
The Chicago Medical School
Chicago, Illinois
and
Jonathan L. Hartwell
National Cancer Institute
National Institutes of Health
Bethesda, Maryland

1957

HEALTH LIBRARY

RC362
.H337
1957
Sup. 1

PUBLIC HEALTH SERVICE PUBLICATION NO. 149

Supplement 1

UNITED STATES GOVERNMENT PRINTING OFFICE, WASHINGTON: 1957

For sale by the Superintendent of Documents, U. S. Government Printing Office
Washington 25, D. C. - Price $3.50

NLM 05 PAM

075273

CONTENTS

	Page
Introduction	1
Corrections to the 2nd Edition of the "Survey"	3
List of abbreviations	8
Tabular review	8
Inorganic compounds	9
Organic compounds	27
Aliphatic	27
Monocyclic	68
Bicyclic	123
Tricyclic	131
Tetracyclic	150
Pentacyclic	170
Azo compounds	205
Steroids	243
Heterocyclic compounds	263
Unclassified	316
Bibliography	320
Cumulative compound index	354
Route index	381
Site-of-application index	382
Species index	383
Tumor-site index	386
Vehicle index	387

INTRODUCTION

The supplement to "Survey of Compounds Which Have Been Tested for Carcinogenic Activity" has retained the format of the previous two editions with some minor modifications. Radioactive materials have not been included on this occasion because it was felt inappropriate to classify these materials on the basis of their chemical structure rather than physical properties.

The number of entries in the present publication indicates an increase in the number of chronic toxicity tests for the period surveyed (1948 thru 1953) as compared with previous compilations. Out of 981 compounds listed, 779 are reported for the first time in these tests. Of the approximately 189 compounds in this Supplement which are found to induce tumors, 159 are new while 30 were reported as negative in the last edition of the "Survey". It can be seen that the proportion of carcinogens among the new compounds (21%) is similar to that found before (23%). In view of the greatly increased interest in carcinogenesis as a problem of human environmental cancer, it is of great importance to analyze the significance of this proportion. If indeed it transpires that almost one in five of all randomly performed chronic toxicity tests will reveal the presence of a carcinogen, then this must be considered to be perhaps the commonest eventuality of such an investigation. Since this Supplement and previous surveys do record all published tests of chemicals lasting more than thirty days, it might be assumed that they represent a random assortment of chronic toxicity data. Close examination of the data reveals that there is a factor of considerable selectivity, particularly with regard to those compounds that are found to be carcinogenic. About one-half (83) of the new carcinogens in fact belong to five chemical classes as shown in the following table:

Class	New Compounds	Carcinogens
Aliphatic		
Carbamates	16	15
Tricyclic		
Aminofluorenes	14	12
Tetracyclic		
Cyclopentenophenanthrenes	14	6
Azo	88	36
Heterocyclic		
Benzacridines	22	14
Total	154	83

Many of these compounds were synthesized especially for study in this regard. The remaining one-half (76) of the new carcinogens, however, are distributed among 620 compounds more randomly selected, or a proportion of about one carcinogen in eight compounds. While some of these latter carcinogens may belong to smaller chemical groupings, it

does seem likely that in the course of routine chronic toxicity tests, a substantial number of carcinogens will appear.

This survey does not, unfortunately, provide the means for determining the likelihood of a compound tested routinely being carcinogenic. The majority of tests performed as toxicity investigations of new material are inadequate from the standpoint of carcinogenesis: many of these studies are not carried on for a long enough period, they often do not record pathological information in sufficient detail, and the bulk of these studies are confined to feeding experiments with rats, often of strains with such spontaneous tumor incidence as to make the detection of carcinogenicity quite impossible.

It is not the purpose of this survey to pronounce upon the carcinogenicity of a tested material. It is merely an organized abstract of the literature in which the opinions of the original authors are recorded. From time to time the views of the abstractors on the interpretation of some experiments may differ from that of the original authors, and on rare occasions this has been stated in the footnotes. It is, however, of paramount importance that this survey not be used as a reference to the activity of a material. It is a guide to the original literature and the worth of each entry must be carefully evaluated by the reader. The authors have attempted to include as much information as possible within the space allocated, but this is often merely enough to provide a basis for debate on the biological significance of the results. A positive entry in the column recording tumor incidence obviously does not mean that a substance has been unequivocally shown to be carcinogenic to the satisfaction of even the majority of workers. There are quite a number of instances of but a single tumor being induced in the course of an experiment. Such a finding on its own may have little meaning particularly in the absence of controls; on the other hand it may be meaningful when considered with other data.

Two of the most debated issues in carcinogenesis as applied to the human may be commented on from surveying this material. The first concerns the matter of species variation and with it the effects of different routes of entry. It is remarkable that so little investigation has been undertaken on various species. A large proportion of the positive results reported refer to mouse investigations, and of these the vast majority refer to experiments on the skin or in the subcutaneous tissues. The survey therefore provides but little data with which to form opinions on the matter of species variation. It is, however, notable that with the potent polycyclic hydrocarbons all the species adequately tested have eventually yielded tumors; notably in this supplement the induction of tumors in the monkey is recorded. A comparison of the data in various species obtained with the aromatic amines, particularly beta-naphthylamine, introduces the second important issue, the significance of the induction of benign tumors. Although the dog is recorded as the only animal developing carcinoma of the bladder following feeding with beta-naphthylamine, it is notable that the rabbit and the rat are repeatedly recorded as developing bladder papillomas. In the instance of the arsenicals, implicated repeatedly as a carcinogen in man, animal studies again repeatedly record the induction of a small incidence of benign skin lesions. Such correlations certainly make a clear evaluation of the significance of the induced benign neoplasm necessary. Gross variations in species responses are exceptional in this material; carbon tetrachloride stands out particularly, inducing hepatomas in the mouse, but not in the rat or several other species tested extensively. In other instances adequate studies of species variation and variations in routes of entry have been accorded little attention, and data recorded to this time does not provide the basis for many views on this subject.

The authors wish to acknowledge the invaluable secretarial assistance of Miss Selma Gerber and Mrs. Elizabeth R. Thomas. Many of the abstracts from the French and German were prepared by Dr. Jean Sicé, from the Italian by Dr. Umberto Saffiotti, and from the Russian by Dr. Michael B. Shimkin. Valuable assistance was also obtained from Mr. Paul DePorte and others of the translation unit of the National Institutes of Health. Lastly the authors wish to thank all those investigators who submitted much unpublished material.

CORRECTIONS TO THE 2ND EDITION OF THE "SURVEY".

p. 11, No. 47. Schürch and Uehlinger. For "1936a" read "1936".
p. 17, No. 64. Dobrovolskaia-Zavadskaia. For "1935a" read "1935 a & b".
_____ No. 64. Dobrovolskaia-Zavadskaia and Adamova. For "1938a" read "1938".
_____ No. 64. Delete whole entry beginning "Dobrovolskaia-Zavadskaia and Adamova, 1938b".
p. 24, No. 90. For "Suntzeff and Babcock" read "Suntzeff et al.".
p. 29, No. 111. Soboleva. For "1938" read "1927".
p. 30, No. 119. Edwards and Dalton. For "1942a" read "1942".
p. 32, No. 125. Iwata and Irrni, 1940a. Read "Iwata and Inui, 1940".
p. 47, No. 210. In 7th column, change "1^{1}" to "2 sarc.^{1}".
_____ fn. 1. change to "And 1 ear duct carcinoma".
p. 48, No. 221, line 1. In 7th column, change "Sarc.^{2}" to "2 sarc.^{2}".
_____ No. 221, item 2. In 7th column, change "5^{3}" to "5 sarc.^{3}".
_____ fn. 3. Change to "3 with ear duct carcinomas, 5 with mammary adenomas, and 1 with cholangioma".
p. 52. For "Orr, 1938b" read "Orr, 1938".
p. 53, No. 229. For "Wicks" read "Wicks and Suntzeff".
p. 68, No. 267. Cook et al. For "1940" read "1940a".
p. 69, No. 273. In formula, CH_2 shoudl be CH_3.
p. 72, No. 283. Last item, beginning "do". Change "do" in 2nd column to "12 rats" and "do" in 6th column to "S.C." and remove and place under No. 281.
_____ No. 285, line 1. In 7th column, change "1 sarc.^{3}" to "2 sarc.^{3}".
_____ No. 285, item 2. In 7th column, change "10^{4}" to "0^{4}".
p. 79, No. 327. For "Hosino, 1940" read "Hosino, 1940a".
_____ No. 329. For "Kinosita, 1940" read "Kinosita, 1940b".
p. 83, No. 347. For "Smith et al." read "Smith, M. I. and McClosky".
p. 86, No. 361. For "Shabad, 1943" read "Shabad, 1945".
p. 87, No. 368. Delete "Maruya, 1937a" and all data following.
_____ No. 368. For "Maruya, 1937b" read "Maruya, 1937".
p. 89, No. 375. For "Kinosita, 1936" read "Kinosita, 1936a".
p. 90, No. 377. For "Fitzhugh et al., 1947" read "Fitzhugh & Nelson, 1947a".
p. 96, No. 395, item 2. In 7th column, change Tumors^{2} to 1 sarc.^{2}.
_____ fn. 2. Add "Also other tumors".
p. 102. Perlmann and Staehler, first ref. For "1932" read "1932a".
p. 103, No. 422. Both refs. For "Hueper" read "Hueper et al.".
p. 103, No. 423. Fitzhugh and Nelson. For "1947" read "1947b".
p. 107. Wilson, R. H. et al. For "1941" read "1941a^{12}". Add fn. 12: "Further pathological observations reported in Cox et al., 1947".
p. 108. Wilson and DeEds. For "1946" read "1946a".
_____ Dunning et al. For "1947" read "1947b".
p. 109, No. 439. Wilson et al. For "1947" read "1947a".
_____ No. 440. For "Shear, 1938" read "Shear, 1938c".
p. 110, No. 442. Wilson and DeEds. For "1946" read "1946b".
p. 111, No. 447. Wilson and DeEds. For "1946" read "1946b".
p. 112, No. 447. Wilson et al. For "1947" read "1947b".
p. 128, No. 523, last item. For "(Mrs. A. M.) 1940a" read "(Mrs. A.M.) 1940".
p. 179, No. 704. For "Badger" read "Badger et al."
p. 189, No. 748. Shear and Leiter. For "1941" read "1941b".
p. 196, No. 773. For "Cook, 1932" read "Cook, 1932b".
p. 204. For "Nakano, 1937a" read "Nakano, 1937".
_____ Delete "Nakano, 1937b" and all data following.
_____ For "Nakano" read "Nakano^{6}".
p. 211. For "Geschickter, 1939" read "Geschickter, 1939b".
p. 223. Shear et al. For "1941" read "1940".
p. 226. Tannenbaum, 1942a, item 3, 5th column. For "9.2" read "0.2".
p. 229. Shimkin and Bryan. For "1944" read "1943".
p. 241. For "Dobrovolskaia-Zavadskaia, 1935" read "Dobrovolskaia-Zavadskaia and Simsilevich, 1935".
p. 248. For "Nakano, 1937a" read "Nakano, 1937".
_____ Delete "Nakano, 1937b" and all data following.
p. 258. For "Franseen" read "Franseen et al.".
p. 261. For "Becks, 1946" read "Beck, S., 1946".
p. 288. For "Lauber et al., 1938a" read "Lauber et al., 1938".
_____ For "Lauber et al., 1938b" read "Lauber et al., 1939".
p. 289. For "Nakano, 1938" read "Nakano, 1939" and transfer item to p. 291.

p. 295. fn. 4. For "Klein" read "Kline".
p. 301. Jones et al. For "1941" read "1940".
p. 316. For "Strong et al." read "Strong and Figge".
_____ For "Greenblatt et al." read "Greenblatt & Kupperman".
p. 330, No. 932. For "Kleinenberg, 1939" read "Kleinenberg, 1939a".
p. 331, No. 933 and p. 331-2, No. 934. Kleinenberg. For "1939" read "1939b".
p. 338, No. 953. For "Kirby, 1944" read "Kirby, 1944b".
p. 343. For "Baumann, 1940" read "Baumann et al., 1940".
p. 344. Sasaki et al. For "1940" read "1940b".
p. 346. For "Andervont" read "Andervont & Edwards".
p. 348, No. 956. For "Kirby, 1945" read "Kirby, 1945b".
_____ No. 959 is o-Aminoazotoluene (No. 955). Delete material and transfer to p. 344.
_____ No. 960 is identical with No. 956 (p-Aminoazotoluene). Delete material and transfer to No. 956.
p. 353, No. 985. Helmholz. For "1904a" read "1907a".
p. 359. For "Law, 1941" read "Law, 1941c".
p. 363. For "Hoch-Ligeti, 1947" read "Hoch Ligeti, 1947b".
p. 372, No. 1029. For "Sugiura" read "Sugiura et al.".
p. 380, Nos. 1047, 1048, and 1049. Kochakian. For "1945" read "1946".
p. 381, No. 1052. Kochakian. For "1945" read "1946".
p. 385. For "Weil, 1938" read "Weil, 1938a".
p. 386, No. 1063. For "Kochakian, 1945" read "Kochakian, 1946".
_____ No. 1063. For "Pizzolato" read "Pizzolato and Beard".
p. 387, No. 1068. Delete "Loeffler, 1938". Data goes under Loeffler, 1928.
p. 391. Selye et al. For "1943" read "1943a".
p. 405. Lipschütz and Iglesias. For "1938a" read "1938".
_____ fn. 8. Reference should read "Lipschütz et al., 1938b".
p. 419, No. 1103. Szabo. For "1941a" read "1940a".
p. 433. For "Champy, 1937" read "Champy, 1937b".
p. 448, No. 1120. Kochakian. For "1945" read "1946".
_____ No. 1121. Isaacs. For "1940b" read "1940".
p. 449, Nos. 1124, 1125, and 1126. Kochakian. For "1945" read "1946".
p. 450, No. 1127. For "Selye and Row" read "Selye et al.".
_____ No. 1127. Kochakian. For "1945" read "1946".
p. 454. Kochakian. For "1945" read "1946".
p. 460. For "Catuly" read "Cutuly".
p. 462. Silberberg and Silberberg. For "1941a" read "1941b".
_____ For "Wilson et al." read "Wilson, J. G. et al.".
p. 463. Kochakian. For "1945" read "1946".
p. 470, No. 1179. For "Gruber" read "Gruber et al."
p. 472, No. 1186. For "Cook, 1940a" read "Cook et al., 1940a".
p. 482, No. 1227. For "Takizawa, 1939a" read "Takizawa, 1939".
_____ No. 1227. Takizawa, 1939b. Delete reference and all data following.
p. 496, No. 1292. Weil and Hetherington. For "1943" read "1942".
p. 497, No. 1295. For "Suntzeff" read "Suntzeff et al.".
p. 502. For "Bullard" read "Bulliard and dos Ghali".
p. 510. Add: Ball, H. A., and Samuels, L. T.: Am. J. Cancer 26: 547-551 (1936).
_____ Delete: Ball, G. H.: J. Endocrinology 3: 302-309 (1943).
Ball, H. J.: Am. J. Cancer 26: 69-84 (1936).
_____ Bang, F. For page "9" read "9-12".
_____ Add: Beck, S.: Nature 156: 238-9 (1945)
p. 511. Bertellotti, L. For "Atti d. soc. studio di dermat. e sif." etc., read "Atti d. soc. di dermat. e sif. (Rome)" etc.
_____ Biddulph, C. For "Anat. Research" etc. read "Anat. Record" etc.
_____ Add: Bisceglie, V.: Althena 9: 353-355 (1940).
p. 513. Add: Büngeler, W.: Frankfurt. Ztschr. f. Path. 39: 314-402 (1930).
: Klin. Wchnschr. 11: 1982-1984 (1932).
: Frankfurt. Ztschr. f. Path. 44: 202-271 (1933).
_____ Add: Burrows, H.: Brit. J. Surg. 25: 204-208 (1937a).
: J. Path. and Bact. 44: 481-483 (1937b).
p. 514. Camerman, J., and Maisin, J. For "Acta biol. belge" read "Acta biol. belg.".
_____ Campbell, J. A. Second reference. For pages "212-221" read "217-221".
_____ Chahovitch, X., and Froniceirc, N.: Read "Acta Path., Belgrade" etc.
_____ Chahovitch, X., and Miletitch, D. L.: Read "Acta Path., Belgrade" etc.
p. 515. Chen, K. K., et al. Read "J. Pharmacol. & Exper. Therap.".
_____ Chevrel-Bodin, M. L. and Cormier, M. For "(1946)" read "(1943)".
_____ Christensen, E. and Holm, J. E. For volume number "54" read "21".

_____ Add: Cook, J. W.: Nature 145: 335-338 (1940).
Cook, J. W., Hewitt, C. L., and Hieger, I.: Nature 130: 926 (1932a).
Cook, J. W., Hieger, I., Kennaway, E. L., and Mayneord, W. V.: Proc. Roy. Soc., London, s.B. 111: 455-484 (1932b).
Cook, J. W., Robinson, A. M. (Mrs.), and Goulden, F.: J. Chem. Soc. 393-396 (1937).
Cook, J. W., and Kennaway, E. L.: Am. J. Cancer 33: 50-97 (1938).

p. 516. Add: Cox, A. J., Wilson, R. H., and De Eds, F.: Cancer Research 7: 647-657 (1947).

p. 517. Dansi, A. For "Ricera" read "Ricerca".

_____ De Eds, F. Add "Cox, A. J.".

_____ De Gaetani, G. F. Read "Arch. ital. di med. sper." etc.

_____ de Haas, A. M. L. Add "(1939)".

p. 518. Dobrovolskaia-Zavadskaia, N., and Adamova, N. For "1938a" read "1938".

_____ Dobrovolskaia-Zavadskaia, N., and Adamova, N. For "1938b" read "1939".

p. 519. Ebert, M. H. For "Symph." read "Syph."

_____ Eisen, M. J. Delete "Cancer Research 2: 632-644 (1942)".

p. 520. Add: Engle, E. T., and Smith, P. E.: Anat. Rec. 61: 471-483 (1935).

_____ Falin, L. I., and Gromzewa, K. E., first ref. For "(1939)" read "(1939a)".

_____ Falin, L. I., and Gromzewa, K. E., second ref. For "(1939)" read "(1939b)".

p. 521. Fitzhugh, O. G., Nelson, A. A., and Bliss, C. I.: Read "J. Pharmacol. & Exper. Therap." etc.

_____ Fitzhugh, Nelson and Calvery. For Vol. "35" read "85".

_____ For "Flushmann" read "Fluhmann".

p. 524. Greenwood, R. To journal reference, after "Psychiat." add "(Chicago)".

_____ Gruber, C. M., et al. Read "J. Pharmacol. & Exper. Therap." etc.

_____ Haag, H. B., and Ambrose, A. M. read "J. Pharmacol. & Exper. Therap.".

p. 525. Hamburger, 2nd ref. After "Scandinav." add "Suppl.".

_____ Hamperl, H. For "1939" read "1938".

Hanzlik, Lehman, etc.
" , Newman, etc.
" , Seidenfeld, etc.
Harris, Anderson, etc. (2 refs.
} Journal references. Read "J. Pharmacol. & Exper. Therap."

_____ Hanzlik, Seidenfeld, etc. For "1930" read "1931".

p. 525. Add: Harada, M.: Tr. Jap. Path. Soc. 21: 319-323 (1931).

_____ Add: Harris, P. N.: Cancer Research 7: 178-179 (1937).

_____ Harris, P. N., 2nd column, line 1. For "Kradhl" read "Krahl".

_____ Add: Hay, L. J., Varco, R. L., Code, C. F., and Wangensteen, O. H.: Surg. Gynec. & Obstet., 75: 170-182 (1942).

p. 526. Add: Hewett, C. L.: J. Chem. Soc. 293-303 (1940).

_____ For "Hoch-Ligetti" read "Hoch-Ligeti".

_____ For "Holch" read "Holck".

_____ Hosino, I., both refs. Journal should be "Zikken Syōkaki-Byōgaku". Move "Biochem. etc." up to follow II.

_____ Add: Hueper, W. C.: Arch. Path. 25: 856-899 (1938).

p. 527. Imakyure, T. Delete "Imura, T."

_____ Imura, T. and Imakyure, T. Delete names and reference.

_____ Isaacs, R., first reference. Delete whole reference.

_____ Isaacs, R., second reference. Change "1940b" to "1940".

_____ Iwata and Inui, first reference. For "1940a" read "1940".

_____ Iwata and Inui, second reference. Delete reference.

p. 528. Add: Jones, B. F., Rothman, A. J., and Shear, M. J. Unpub. results cited in Shear et al., 1940.

_____ Add: Kaufmann, C., and Steinkamm, E.: Arch. f. Gynäk. 162: 553-594 (1936).
Kaufmann, C., and Steinkamm, E.: Ztschr. Geburtsh. Gynäk. 114: 382-387 (1937).
Kawaji, J.: Gann 33: 238-240 (1939).
Keijser, S.: Tumorvormingdoor 1:2:5:6-Dibenzanthraceen. Diss. Groningen, 1934.
Kensler, C. J., Sugiura, K., and Rhoads, C. P.: Science 91: 623 (1940).
Kensler, C. J., Sugiura, K., Young, N. F., Halter, C. R., and Rhoads, C. P.: Science 93: 308-310 (1941b).
Kensler, C. J., Young, N. F., and Rhoads, C. P.: Proc. Soc. Exper. Biol. & Med. 48: 22-24 (1941a).

p. 528. Add: Kimura, T., and Imakyure, T.: Tr. Jap. Path. Soc. 27: 6-11 (1937).
Klinke, J.: Ztschr. f. Krebsforsch. 46: 334 (1937).
Ztschr. f. Krebsforsch. 47: 341-347 (1938a).
Ztschr. f. Krebsforsch. 47: 348-362 (1938b).

Kobata, K.: Osaka Igakkai Zasshi 36: 364 (1937). Cited by Kinosita, 1937.

p. 529. Kleinenberg, G. E., first reference. Change "Arch." to "Arkh.".

_____ Kochakian, last line. For "1945" read "1946".

_____ Korosteleva, T. A., first ref. Journal should be "Laboratornaia praktika".

p. 530. For "Kradhl" read "Krahl".

_____ Lacassagne, refs. 2-5 incl. Journal should be "Compt. rend. Soc. de biol."

p. 531. Lanza, G., 3rd ref. Delete "lo" and put "Sper." before "Arch.".

_____ Lanzara, A. Read "Arch. ital. Med. sper.".

_____ Laqueur, 3rd ref. For "Flukmann" read "Fluhmann".

_____ Law, first ref. For "1946" read "1940".

_____ Add: Law, L. W.: Proc. Soc. Exper. Biol. & Med. 47: 37-39 (1941d).

p. 532. Add: Leonard, S. L., Meyer, R. K., and Hisaw, F. L.: Endocrinology 15: 17-24 (1931).

_____ Add: Lewis, M. R.: Am. J. Cancer 36: 34-43 (1939).

p. 533. Lipschütz, A., and Iglesias, R., first reference. For "1938a" read "1938".

_____ Lipschütz, A., and Iglesias, R., second ref. Delete whole reference.

_____ Add: Lipschütz, A., and Vargas, L., Jr.: Proc. Soc. Exper. Biol. & Med. 48: 584-587 (1941b).

_____ Lipschütz, A., and Vargas, L., Jr. Last reference. After "Lancet" insert "240:".

_____ Add: Lipschütz, A., Vargas, L., Jr., and Iglesias, R.: Compt. rend. Soc. de biol. 129: 524-528 (1938).

_____ Lipschütz et al., 1st column, last line. "1939d" should read "1939e".

_____ Add: Loeb, L., Suntzeff, V., and Burns, E. L.: Am J. Cancer 34: 413-427 (1938).

p. 534. Add: McEuen, C. S.: Am. J. Cancer 27: 91-94 (1936).
: Am. J. Cancer 34: 184-195 (1938).
: Am. J. Cancer 36: 551-556 (1939).

_____ Add: McEuen, C. S., Selye, H., and Collip, J. B.: Lancet 230: 775-776 (1936a)
Proc. Soc. Exper. Biol. & Med. 35: 56-58 (1936b).
Proc. Soc. Exper. Biol. & Med. 40: 241-244 (1939).

_____ Add: McIntoch, J., and Selbie, F. R.: Brit. J. Exper. Path. 20: 49-63 (1939).

p. 535. Maisin, J., and deJonghe, 2nd ref. Change "deJonghe, A." to "Coolen, M. L." and move reference up under Maisin and Coolen.

_____ Maruya, H. Add "See Mizuta, T."

_____ Add: Maruya, H.: Osaka Igakkai Zassi 35: 2304 (1936).

p. 536. Mattis et al. Read "J. Pharmacol. & Exper. Therap.".

p. 537. Mizutani and Maruya. Delete whole reference.

_____ Morris et al., 1st ref. Read "J. Pharmacol & Exper. Therap.".

p. 538. Add: Murphy, J. B.: Cancer Research 4: 622-624 (1944).

_____ Add: Nakahara, W., and Mori, T.: Gann 35: 208-230 (1941a).

_____ Delete: Nakahara et al.: Gann 34: 406-427 (1940).

_____ For "Nagazawa" read "Nakazawa" and place below in proper place.

p. 539. Oberling, Guérin and Guérin, 2nd ref. Add "198-213 (1939a)" after "28".

_____ Oberling et al., 11 lines from bottom. Read "Leeuw.-Vereen. 4: 57-63 (1937)".

p. 540. Orr, J. W., 4th ref. For "1939" read "1938".

_____ Delete: Pagge, J. C.: Arch. Path. 42: 598-616 (1946).

_____ Paletta, F. X. and Max. After "Max" add "P.F.".

_____ Peacock, P. R., next to last ref. For "1935a" read "1935".

_____ Peacock, P. R., last ref. After "Leeuw.-Vereen.", delete "Amsterdam (1935b)" and add "3:91-94 (1936)".

_____ Pecco, A.: For "Pecco" read "Picco", and add "(ser.2)" after "17", and relocate whole ref. to p. 541.

p. 541. Add: Peredelsky, A. A.: Compt. rend. Acad. Sci. USSR. 32: 448-450 (1941).

_____ Add: Perry, I. H.: Proc. Soc. Exper. Biol. & Med. 39: 346-347 (1938).

Pollia, 1st reference. For "1939" read "1940".

p. 542. Presco, A. Delete name and whole reference.

_____ Add: Raposo, L. S.: Compt. rend. Soc. de biol. 98: 997-999 (1928b).

_____ Add: Reimann, S. P.: Am. J. Cancer 15: 2149-2168 (1931).

p. 543. Add: Roffo, A. H.: Ztschr. f. Krebsforsch. 47: 473-497 (1938).
Roffo, A. H.: 3rd Internat. Cancer Congr. 116 (1939).
Rondoni, P.: Biol. med., Milano 12: 47-60 (1936).
: Ztschr. f. Krebsforsch. 47: 59-83 (1937).

_____ Roussy, Guérin and Guérin, 4th, 6th, and 8th refs. For "Compt. rend. Soc. de biol." read "Compt. rend Acad. d. sc.".

_____ Roussy et al., 1936a. Journal should be "Bull. Assoc. franc. p.l'étude du cancer".

p. 544. Add: Rusch, H. P., Johnson, R. O., and Kline, B. E.: Cancer Research 5: 705-712 (1945c).

_____ For "Saberg" read "Säberg".

_____ Add: Schabad, L. M.: Cancer Research 5: 405-419 (1945).

_____ Schabad, L. M. and Buvailo, S. A.: Biull. eksper. biol. i med. (Moscow) 21: 20-23 (1946).

p. 545. Add: Schabad, L. M., and Kleinenberg, G. E.: Biull. eksper. biol. i med. (Moscow) 8:282-284 (1939).

_____ first column. After Schurch, O. add "and Uehlinger, E.". First ref: delete "No. 3/4" and add "3:271-272"; change "1936a" to "1936".

_____ Schürch and Uehlinger, 2nd ref. (column 2, line 1): change "1936b" to "1937".

_____ Add: Selbie, F. R.: Lancet 231: 847-848 (1936).

: Brit. J. Exper. Path. 19:100-107 (1938).

_____ Add: Seligman, A. M., and Shear, M. J., in Hartwell, J. L., "Survey of Compounds Which Have Been Tested for Carcinogenic Activity", Fed. Sec. Agency, 1941.

p. 546. Selye et al., first reference. For "188-192 (1943)" read "88-92 (1943a)".

_____ Selye et al., second reference. For "1943" read "1943b".

_____ Add: Serono, C., and Montezemolo, R.: Bull. e Atti R. Accad. Med. di Roma 64: 157-163 (1938).

_____ Seyale, G. C. Should be "Segale" and reference moved to correct place on p. 545.

_____ Add: Shear, M. J., and Leiter, J.: J. Nat. Cancer Inst. 1: 303-336 (1940).

_____ Shear, M. J., Leiter, J., and Perrault, A.: J. Nat. Cancer Inst. 2: 99-113 (1941a).

_____ Shear, M. J., and Lorenz, E.: Am. J. Cancer 36: 201-210 (1939).

p. 547. Add: Skarzynski, B. See von Euler, H.

p. 548. Add: Strong, L. C.: Cancer Research 1:572-574 (1941).

p. 549. Syverton and Berry. For "1941" read "1940".

p. 551. Add: von Euler, H., Skarzynski, B., and Säberg, I.: Ark. f. Kemi, Mineral. Och Geol. 17: 1-11 (1944).

p. 552. Add: Warren, F. L.: Biochem. J. 33: 729-733 (1939).

_____ Wentworth, J. H., Smith, P. K., and Gardner, W. U.: Endocrinology 26: 61-67 (1940).

_____ White, A. W. M.: J. Cancer Research 11:111-125 (1927).

p. 553. Add: White, J., Mider, G. B., and Heston, W. E.: J. Nat. Cancer Inst. 3: 453-454 (1943).

_____ Wilson, R. H. See Cox, A. J.

_____ Column 2. Wilson et al., "1941c" should be "1947c".

p. 554. Add: Zimmerman, H. M., and Arnold, H.: Am. J. Path. 19: 939-950 (1943).

_____ Zuckerman, S.: J. Endocrinol. 2: 263-267 (1941).

_____ Zuckerman and Parkes, 1941. Delete whole reference.

p. 555. For "Acetylaminochrysene" read "5-Acetylaminochrysene".

_____ For "4-Amino-2,3-dimethylazobenzene" read "4-Amino-2',3-dimethylazobenzene. See o-Aminoazotoluene".

After "6-Amino-3,4'-dimethylazobenzene", add "See p-Aminoazotoluene". Delete "960".

p. 560, 2nd column, 6th compound. For "α-δ" read "β,δ".

p. 579. For "Trachia" read "Trachea".

LIST OF ABBREVIATIONS

ad lib.--ad libitum
alk.--alkaline
b.u.--benzoate unit (s)
ca.--circa
carc.--carcinoma (s)
castr.--castrate
cc.--cubic centimeter (s)
corr.--corrected
C.P.--chemically pure
d.--day(s)
dec.--decomposes
epi.--epithelioma (s)
F--female
fig.--figure(s)
fn.--footnote
gm.--gram (s)
hr(s).--hour(s)
i.b.u.--international benzoate unit (s)
I.M.--intramuscular
inj.--injection (s)
I.P.--intraperitoneal
I.T.--intratracheal
I.U.--international units
I.V.--intravenous
kg.--kilogram (s)
l.--left
M--male
m.c.--microcurie (s)
mg.--milligram (s)
ml.--milliliter (s)
mm.--millimeter (s)
m.mols--millimoles
mo (s).--month (s)
m.u.--mouse unit (s)
neg.--negative
pap.--papilloma (s)
P.O.--per os
r.--right
R.I.--Rhode Island
r.u.--rat unit (s)
S.C.--subcutaneous
sarc.--sarcoma (s)
soln.--solution
sq.--square
unpub.--unpublished
wk(s).--week(s)
yr(s).--year(s)

TABULAR REVIEW

The classification of the compounds follows that adopted in the previous editions of the "Survey". The nomenclature is in general the same as before, being as far as possible the various authors' own. Where different names have been applied to the same compound, the name used in the second edition of the "Survey", or the name most consistent with American usage, has been used; alternate names have been included in the Compound Index for convenience. The principal change from the last edition of the "Survey" is in the nomenclature of the benzacridines, most of which have come from the French literature. The small number of benzacridines appearing in the last edition had been renamed to conform with the American numbering system. However, it was believed that if the large number of benzacridines appearing in the present work were similarly renamed, confusion would be created. Accordingly, the authors' names have been retained. Where the same benzacridine appears in both the second edition and in this Supplement, both names have been included in the Subject Index. Every attempt has been made to make the structural formulas correct throughout the work, in many cases clarification of doubtful points having been obtained from the authors or, in the case of commercial products, manufacturers.

COMPOUNDS TESTED FOR CARCINOGENIC POTENCY

A--INORGANIC COMPOUNDS

Reference	Animal	Strain or type	Sex	Preparation and dose	Site and route	Animals with tumors	Survival	Duration of experiment
1. --AMMONIA								
Weatherby, 1952	12 guinea pigs	----	M	140-200 p.p.m., 6 hrs. per d., 5 d. per wk. for 12 wks.	Inhalation	0	4 sacrificed at 6 wks.	18 wks.
2. --AMMONIUM ACETATE								
Fazekas, 1953	5 rabbits	----	F	0.1-0.7 gm. per kg. body wt. dissolved in 50-100 cc. of water, twice daily for 13 mos.	P.O.	0[1]	----	16 mos.
	rabbits	----	F	0.1-0.2 gm. per kg. body wt. dissolved in 100-150 cc. of water, twice daily for 5 mos.	P.O.	0[1]	----	5 mos.
3. --AMMONIUM CARBONATE								
Fazekas, 1953	5 rabbits	----	F	0.1-0.7 gm. per kg. body wt. dissolved in 50-100 cc. of water, twice daily for 13 mos.	P.O.	0[1]	----	16 mos.
	rabbits	----	F	0.1-0.2 gm. per kg. body wt. dissolved in 100-150 cc. of water, twice daily for 5 mos.	P.O.	0[1]	----	5 mos.
4. --AMMONIUM CHLORIDE								
Fazekas, 1953	5 rabbits	----	F	0.1-0.7 gm. per kg. body wt. dissolved in 50-100 cc. of water, twice daily for 13 mos.	P.O.	0[1]	----	16 mos.
	50 rabbits	----	F	0.1-0.2 gm. per kg. body wt. dissolved in 100-150 cc. of water, twice daily for 5 mos.	P.O.	0[1]	----	5 mos.
5. --AMMONIUM HYDROPHOSPHATE								
Fazekas, 1953	5 rabbits	----	F	0.1-0.7 gm. per kg. body wt. dissolved in 50-100 cc. of water, twice daily for 13 mos.	P.O.	0[1]	----	16 mos.
	rabbits	----	F	0.1-0.2 gm. per kg. body wt. dissolved in 100-150 cc. of water, twice daily for 5 mos.	P.O.	0[1]	----	5 mos.
6. --AMMONIUM HYDROXIDE								
Fazekas, 1953	96 rabbits	----	F	0.1-0.2 gm. per kg. body wt. dissolved in 100-150 cc. of water, twice daily for 5 mos.	P.O.	0[1]	----	5 mos.
7. --AMMONIUM SULFATE								
Fazekas, 1953	5 rabbits	----	F	0.1-0.7 gm. per kg. body wt. dissolved in 50-100 cc. of water, twice daily for 13 mos.	P.O.	0[1]	----	16 mos.
	rabbits	----	F	0.1-0.2 gm. per kg. body wt. dissolved in 100-150 cc. of water, twice daily for 5 mos.	P.O.	0[1]	----	5 mos.

[1] Pathology report "elsewhere".

Reference	Animal	Strain or type	Sex	Preparation and dose	Site and route	Animals with tumors	Survival	Duration of experiment
8. --BERYLLIUM								
Barnes, 1950	24 rabbits	----	----	Finely divided metal in water, 50 mg. total dose per rabbit	I.V.	tumors[2]	17 died within 5 wks.	at least 5 wks.
Sissons, 1950a	rabbits	----	----	----	I.V.	tumors	----	----
Dutra, 1951	5 pigs	----	M	Fragments up to 0.01 mg.	S.C.	0	----	6 mos.
9. --BERYLLIUM CARBONATE								
Casarotto, 1952	1 dog	----	----	1.3 gm. for 104 d., in diet	P.O.	0[3]	died in 104 d.	104d.
	1 dog	----	----	0.5-1.5 gm. for 109d., in diet	P.O.	0[3]	died in 109 d.	109 d.
10. --BERYLLIUM CHLORIDE								
Boyland and Sargent, 1951	15 mice	C57	----	10 or 50 mg. per ml. in water, 0.05 ml. of solution in 32 or 28 sites	Intradermal	0	----	----
11. --BERYLLIUM FLUORIDE								
Stokinger et al., 1951	6 dogs	----	----	aerosol - 32 weeks	Inhalation	0	2 died by 10 wks.	32 wks.
	3 rabbits	----	----	aerosol, 2.2 mg. per cu.m. of air, 6 hrs. daily for 23 wks.	Inhalation	0	----	23 wks.
Stokinger et al., 1953	5 cats	----	----	1 mg. per $m.^3$, 6 hrs. per day, 5 d. per wk. for 100 d.	Inhalation	0	----	100 d.
	14 dogs	----	----	1 mg. per $m.^3$, 6 hrs. per day, 5 d. per wk. for 207 d.	Inhalation	0[4]	3 died by 70 d.	207 d.
	120 rats	Albino	M	1 mg. per $m.^3$, 6 hrs. per day, 5 d. per wk. for 207 d.	Inhalation	0[5]	73 died by 19 d.	207 d.
	10 rabbits	----	M	1 mg. per $m.^3$, 6 hrs. per day, 5 d. per wk. for 207 d.	Inhalation	0	----	207 d.
12. --BERYLLIUM HYDROXIDE								
Breedis, 1952	18 salamanders	([6])	----	0.02 cc. of a 5% suspension in distilled water for 130 d.	S.C.	0	----	at least 130 d.
13. --BERYLLIUM OXIDE								
Cloudman et al., 1949	mice	----	----	1.54 mg. total dose in 20-22 semi-weekly injections	I.V.	0	----	at least 1 yr.
Davies and Harding, 1950	23 rats	----	----	50 mg. in 1 ml. saline or milk, 50 times	I.T.	0[7]	----	over 4 wks.

[2] 2 Bone sarcomas.
[3] Investigation limited to parathyroid and teeth.
[4] Areas of bronchial erosion and proliferation.
[5] Bronchial epithelial proliferation seen.
[6] Triturus viridescens (6 with accessory limbs).
[7] Granulomas in the lungs.

Reference	Animal	Strain or type	Sex	Preparation and dose	Site and route	Animals with tumors	Survival	Duration of experiment
13. --BERYLLIUM OXIDE--Continued								
Dutra and Largent, 1950	6 rabbits	----	M&F	0.7 μg. per 100 cc. in water 3 times weekly (total dose 0.013 - 0.116 gm. per kg. body wt. as beryllium metal)	I.V.	6[8]	----	at least 16 mos.
Hall et al., 1950	1 cat	----	M	85 mg. per cu. m., 15 d. exposure	Inhalation	0	----	2.5 mos.
	1 monkey	----	M	85 mg. per cu. m., 15 d. exposure (Fluorescent grade)	Inhalation	0	----	2 mos.
	4 dogs	----	F	10 mg. per cu. m. for 40 d.	Inhalation	0	----	40 d.
Hoagland et al., 1950	9 rabbits	----	M&F	1% suspension in saline, 5 cc. each day or every 4 d.	I.V.	1[9]	----	----
Nash, 1950	rabbits	----	----	1% suspension, repeated injections	I.V.	Tumors[8]	----	----
Dutra et al., 1951	6 rabbits	----	----	6 μg. beryllium per liter air 5 hrs. per d. for 9 - 13 mos.	Inhalation	1[9]	----	17.5 mos.
	8 rabbits	----	----	30 μg. beryllium per liter air 5 hrs. per d. for 9 - 13 mos.	Inhalation	0	----	13 mos.
	5 rabbits	----	----	1 μg. beryllium per liter air 5 hrs. per d. for 9 - 13 mos.	Inhalation	0	----	13 mos.
	5 pigs	----	M	5 mg. powder. (implanted)	S.C.	0[10]	----	6 mos.
Stokinger et al., 1951	3 rabbits	----	----	aerosol, 80 mg. per $m.^3$	Inhalation	0	----	23 wks.
14. --BERYLLIUM PHOSPHATE								
Hoagland et al., 1950	5 rabbits	----	M&F	0.1% suspension in saline, 5 cc. daily or every 4 d.	I.V.	0	----	----
15. --BERYLLIUM SILICATE								
Barnes, 1948	rabbits	----	----	Suspension	I.V.	Tumors[11]	----	over 8 mos.
Barnes et al., 1950	23 rabbits	Mixed breeds	M&F	10 - 20% aqueous suspension, 1 ml. 6 - 10 inj. (total dose 1.0 - 1.2 g.)	I.V.	Tumors[12]	----	at least 120 wks.
Sissons, 1950a	rabbits	----	----	Aqueous suspension, 1 gm. total	I.V.	Tumors[13]	----	----
16. --BERYLLIUM SULPHATE								
Barnes, 1948	mice	----	----	2.5% in drinking water or diet	P.O.	0	all died in 6 - 12 wks.	12 wks.

[8] Osteogenic sarcomas.
[9] Osteogenic sarcoma with metastases.
[10] Atypical beryllium granulomas.
[11] Multiple osteogenic sarcoma after 8 months.
[12] 1 Bone sarcoma.
[13] Osteogenic sarcoma in a high proportion of long term survivors. Details in another publication.

Reference	Animal	Strain or type	Sex	Preparation and dose	Site and route	Animals with tumors	Survival	Duration of experiment
16.--BERYLLIUM SULPHATE--Continued								
Barnes, 1948	rats	----	----	2.5% in drinking water or diet	P.O.	0	all died in 6 - 12 wks.	12 wks.
	rats	----	----	1% in drinking water ad lib.	P.O.	0	no toxic effects seen	1 yr.
	mice	----	----	1% in drinking water ad lib.	P.O.	0	no toxic effects seen	1 yr.
Stokinger et al., 1950a	15 rats	Albino	M	47 mg. beryllium per $m.^3$, 6 hrs. per d., 5 d. per wk. for 51 d., aerosol	Inhalation	0	13 died	51 d.
	47 rats	Albino	M	10 mg. beryllium per $m.^3$, 6 hrs. per d., 5 d. per wk. for 95 d., aerosol	Inhalation	0	23 died	95 d.
	20 rats	Albino	M	0.95 mg. beryllium per $m.^3$, 6 hrs. per d., 5 d. per wk. for 100 d., aerosol	Inhalation	0	100% alive	100 d.
	5 dogs	----	M	47 mg. beryllium per $m.^3$, 6 hrs. per d., 5 d. per wk. for 51 d., aerosol	Inhalation	0	4 died	51 d.
	5 dogs	----	M&F	10 mg. beryllium per $m.^3$, 6 hrs. per d., 5 d. per wk. for 95 d., aerosol	Inhalation	0	100% alive	95 d.
	5 dogs	----	M&F	0.95 mg. beryllium per $m.^3$, 6 hrs. per d., 5 d. per wk. for 100 d., aerosol	Inhalation	0	100% alive	100 d.
	5 cats	----	M&F	47 mg. beryllium per $m.^3$, 6 hrs. per d., 5 d. per wk. for 51 d., aerosol	Inhalation	0	4 died	51 d.
	5 cats	----	M&F	10 mg. beryllium per $m.^3$, 6 hrs. per d., 5 d. per wk. for 95 d., aerosol	Inhalation	0	1 died	95 d.
	4 cats	----	M&F	0.95 mg. beryllium per $m.^3$, 6 hrs. per d., 5 d. per wk. for 100 d., aerosol	Inhalation	0	100% alive	100 d.
	10 rabbits	----	M	47 mg. beryllium per $m.^3$, 6 hrs. per d., 5 d. per wk. for 51 d., aerosol	Inhalation	0	1 died	51 d.
	24 rabbits	----	M&F	10 mg. beryllium per $m.^3$, 6 hrs. per d., 5 d. per wk. for 95 d., aerosol	Inhalation	0	2 died	95 d.
	23 rabbits	----	M	0.95 mg. beryllium per $m.^3$, 6 hrs. per d., 5 d. per wk. for 100 d., aerosol	Inhalation	0	100%	100 d.
	12 guinea pigs	----	F	47 mg. beryllium per $m.^3$, 6 hrs. per d., 5 d. per wk. for 51 d., aerosol	Inhalation	0	7 died	51 d.
	34 guinea pigs	----	F	10 mg. beryllium per $m.^3$, 6 hrs. per d., 5 d. per wk. for 95 d., aerosol	Inhalation	0	2 died	95 d.
	20 guinea pigs	----	F	0.95 mg. beryllium per $m.^3$, 6 hrs. per d., 5 d. per wk. for 100 d., aerosol	Inhalation	0	100% alive	100 d.
	5 monkeys	----	M&F	10 mg. beryllium per $m.^3$, 6 hrs. per d., 5 d. per wk. for 95 d., aerosol	Inhalation	0	100% alive	95 d.

Reference	Animal	Strain or type	Sex	Preparation and dose	Site and route	Animals with tumors	Survival	Duration of experiment
16.--BERYLLIUM SULFATE--Continued								
Stokinger et al., 1950a	2 monkeys	----	M&F	0.95 mg. beryllium per $m.^3$, 6 hrs. per d., 5 d. per wk. for 100 d., aerosol	Inhalation	0	100% alive	100 d.
	2 goats	----	M&F	10 mg. beryllium per $m.^3$, 6 hrs. per d., 5 d. per wk. for 95 d., aerosol	Inhalation	0	100% alive	95 d.
	2 pigs	----	----	47 mg. beryllium per $m.^3$, 6 hrs. per d., 5 d. per wk. for 51 d., aerosol	Inhalation	0	100% alive	51 d.
	10 hamsters	----	M&F	47 mg. beryllium per $m.^3$, 6 hrs. per d., 5 d. per wk. for 51 d., aerosol	Inhalation	0	5 died	51 d.
	83 hamsters	---	M&F	0.95 mg. beryllium per $m.^3$, 6 hrs. per d., 5 d. per wk. for 100 d., aerosol	Inhalation	0	100% alive	100 d.
	38 mice	----	M&F	47 mg. beryllium per $m.^3$, 6 hrs. per d., 5 d. per wk. for 51 d., aerosol	Inhalation	0	4 died	51 d.
	4 chickens	----	M&F	47 mg. beryllium per $m.^3$, 6 hrs. per d., 5 d. per wk. for 51 d., aerosol	Inhalation	0	100% alive	51 d.
Stokinger et al., 1950b	10 rats	Albino	M	9 mg. per $m.^3$ on alternate days (total 62 exposure hours)	Inhalation	0	----	1 mo.
	20 rats	Albino	M	9 mg. per $m.^3$ daily (total 124 exposure hrs.)	Inhalation	0	----	1 mo.
Stokinger et al., 1951	4 dogs	----	----	3.6 mg. per $m.^3$ of air as a mist, 6 hrs. daily, 5 d. per wk.	Inhalation	0	----	115 d.
	40 rats	----	----	As a mist	Inhalation	0	----	6 wks.
	8 dogs	----	----	Mist, 4 mg. per $m.^3$	Inhalation	0	2 died	6 wks.
17.--BORIC ACID								
Mulines et al., 1953	rats	Albino	M	Aqueous solution at pH 6.5 - 7.5 with NaOH, twice daily, 6 d. per wk., 33 mg. per kg.	S.C.	0	100% alive	33 d.
	20 rats	Albino	M	Aqueous solution at pH 6.5 - 7.5 with NaOH, twice daily, 6 d. per wk., 0.1% solution, 10 mg. per kg.	S.C.	0	5 died	2 mos.
	45 rats	Albino	M	Aqueous solution at pH 6.5 - 7.5 with NaOH, twice daily (total dose 0.23, 0.57, 1.14 or 2.85)	S.C.	0	27 died	90 d.
	rats	Albino	M	Aqueous solution at pH 6.5 - 7.5 with NaOH, 1.0 gm. per kg. for 40 d.	S.C.	0	----	40 d.
18.--BORON								
Spiegl 1953	15 mice	----	----	73 mg. of dust per cu. m. 7 hrs. per d., 5 d. per wk. for 30 d.	Inhalation	0	100% alive	65 d.

Reference	Animal	Strain or type	Sex	Preparation and dose	Site and route	Animals with tumors	Survival	Duration of experiment
19.--BORON TRIFLUORIDE[13a]								
Spiegl, 1953	5 dogs	----	----	100 p.p.m., 30 exposures, 6 hrs. per d., 6 d. per wk.	Inhalation	0	----	34 d.
	12 rabbits	----	----	100 p.p.m., 30 exposures, 6 hrs. per d., 6 d. per wk.	Inhalation	0	----	34 d.
	6 cats	----	----	100 p.p.m., 30 exposures, 6 hrs. per d., 6 d. per wk.	Inhalation	0	----	34 d.
	40 guinea pigs	----	----	100 p.p.m., 30 exposures, 6 hrs. per d., 6 d. per wk.	Inhalation	0	3% died	34 d.
	140 rats	----	----	100 p.p.m., 30 exposures, 6 hrs. per d., 6 d. per wk.	Inhalation	0	2% died	34 d.
20.--BORON TRIFLUORIDE DIMETHYL ETHER[13b]								
Spiegl, 1953	5 dogs	----	----	50 or 27 p.p.m., 6 hrs. per d., 6 d. per wk., 30 times	Inhalation	0	----	34 d.
	6 cats	----	----	50 or 27 p.p.m., 6 hrs. per d., 6 d. per wk., 30 times	Inhalation	0	----	34 d.
	140 rats	----	----	50 or 27 p.p.m., 6 hrs. per d., 6 d. per wk., 30 times	Inhalation	0	24% died	34 d.
	100 mice	----	----	50 or 27 p.p.m., 6 hrs. per d., 6 d. per wk., 30 times	Inhalation	0	100% died	34 d.
	40 guinea pigs	----	----	50 or 27 p.p.m., 6 hrs. per d., 6 d. per wk., 30 times	Inhalation	0	7% died	34 d.
	12 rabbits	----	----	50 or 27 p.p.m., 6 hrs. per d., 6 d. per wk., 30 times	Inhalation	0	----	34 d.
21.--CADMIUM CHLORIDE								
Wilson and DeEds, 1950	19 rats	----	----	62, 125 or 250 p.p.m., in the diet (various diets)	P.O.	0	----	340 d.
Plum, 1951	Rabbit	----	----	0.1 gm. daily	P.O.	0[14]	----	30 d.
	Rats	----	M	0.015% soln., 5 ml. daily	S.C.	0[14]	----	35 d.
22.--CADMIUM OXIDE								
Princi and Geever, 1950	10 dogs	----	----	Average 4 mg. per cu. m. dust in air, 6 hrs. per d., 5 d. per wk.	Inhalation	0	Several killed	15 mos.

[13a] BF_3

[13b] $BF_3,(CH_3)_2O$

[14] Spleen hyperplasia.

Reference	Animal	Strain or type	Sex	Preparation and dose	Site and route	Animals with tumors	Survival	Duration of experiment
23.--CADMIUM SULFATE								
Grushko et al., 1951	4 rabbits	----	----	0.01 - 100 mg. per liter in water, total 0.051 - 510 mg. in 255 d.	P.O.	0	----	at least 255 d.
	3 rabbits	----	----	0.2 - 1 mg. per liter in water, total of 0.448 - 2.24 mg. in 112 d.	P.O.	0	----	at least 112 d.
24.--CADMIUM SULFIDE								
Princi and Geever, 1950	10 dogs	----	----	Average 4 mg. per cu. m. dust in air, 6 hrs. per d., 5 d. per wk.	Inhalation	0	Several killed	15 mos.
25.--CALCIUM CARBONATE								
Carminati and Chirico, 1951b	4 rats	----	M	1.5% in saline, 1 ml.	S.C.[14a]	0	----	30 d.
26.--CALCIUM CHLORIDE								
Fazekas, 1953	5 rabbits	----	F	0.1 - 0.7 gm. per kg. dissolved in 50-100 cc. of water twice daily for 13 mos.	P.O.	0[1]	----	16 mos.
	rabbits	----	F	0.1 - 0.2 gm. per kg. body wt. dissolved in 100 - 150 cc. of water twice daily for 5 mos.	P.O.	0[1]	----	5 mos.
27.--CALCIUM FLUORIDE								
Fleming, 1953	12 rats	white	M&F	0.15 cc. of 0.1% aqueous solution daily for 28 injections[15]	I.P.	0	----	60 d.
	56 guinea pigs	----	M&F	0.0013% or 0.002% in water[15]	P.O.	0	----	35-55 d.
	22 guinea pigs	----	M&F	0.15 cc. of 0.1% aqueous soln. daily for 15 injections[15]	I.P.	0	----	40 d.
	23 mice	dba	M&F	0.002% in water[15]	P.O.	0	----	55 d.
28.--COBALT CHLORIDE								
Cajano, 1951	10 guinea pigs	----	----	1 cc. of 0.5% aqueous solution every 3 d.	S.C.	0	mean 60.0 d.	at least 60 d.
	10 guinea pigs	----	----	1 cc. of 0.5% aqueous solution on alternate days, then 1 cc. every 3 d.	S.C.	0	mean 81.8 d.	at least 60 d.
	10 guinea pigs	----	----	2 cc. of 0.5% aqueous solution daily	S.C.	0	mean 30.4 d.	over 30 d.
Mirone and Wade, 1953	mice	C3H,CF_1, C57, dba	----	58 mg. daily in the diet	P.O.	0[15b]	----	10 wks.

[1] Pathology report "elsewhere".
[14a] In both inguinal regions.
[15] Plus transplant of tooth germs.
[15b] No pathology discussed.

Reference	Animal	Strain or type	Sex	Preparation and dose	Site and route	Animals with tumors	Survival	Duration of experiment
29. --COBALT FLUORIDE[15a]								
Hodge and Maynard, 1953	60 rats	Albino	----	0.01 - 0.1% in the diet for 35 d.	P.O.	0	10 died at 0.1% level	35 d.
30. --COBALT NITRATE								
Thomas and Thiery, 1953	rabbits	----	M&F	10 ml. (1 mg. metal) daily for 5 d.	S.C.	tumors[16]	----	Unknown
	2 rabbits	----	F	10 ml. (1 mg. metal) daily for 5 d.[17]	S.C.	2[18]	----	22 to 37 d.
	12 rats	----	----	2 ml. (0.2 mg. metal) daily for 5 d.	S.C.	0	----	Unknown
	6 mice	----	----	1 ml. (0.1 mg. metal) daily for 5 d.	S.C.	0	----	Unknown
31. --COBALT SULFATE								
Orten and Bucciero, 1948	10 rats	Albino	M	0.5 mg. daily in aqueous solution	S.C.	0[19]	----	10 wks.
	40 rats	Albino	M	0.477 gm. per kg. in diet[19a]	P.O.	0[19]	----	20 wks.
Bucciero and Orten, 1948	36 rats	Albino	M	2.0 or 6.0 gm. per kg. of the diet[19b]	P.O.	0[19]	----	20 wks.
32. --COPPER								
Pedrero and Kozelka, 1951	40 rats	Sprague-Dawley	M	0.25% or 0.5% in the diet	P.O.	0	22 lived	180 d.
Takada, 1952	rabbits	----	----	Insufflated with copper powder, 4 hrs. per day, every day at definite intervals	Skin	0[20]	----	at least 360 d.
33. --COPPER CHLORIDE								
Takada, 1952	rabbits	----	----	0.5% solution every day or at definite days--up to 307 d.	I.V.	0[20]	----	at least 307 d.
34. --COPPER SULFATE								
Kaufman et al., 1952	5 rats	Albino	M	0.1% in the diet, 3 - 4 mos.	P.O.	0	----	4 mos.
	14 rats	Albino	M	0.1% in the diet	P.O.	0	----	8 mos.
	12 rats	Albino	M	0.1% - 0.5% in the diet	P.O.	0	----	2.5 mos.
Tachibana, 1952	rabbits	----	----	0.1 ml. of a 1% solution daily or every other day up to 400 d. and over	P.O.	0[20]	----	over 400 d.

[15a] CoF_3
[16] Liposarcoma
[17] Fattening diet of oats and bran for 9 months previous to experiment.
[18] Liposarcoma in lumbar region.
[19] Polycythemia developed.
[19a] Various dietary supplements used.
[19b] Some with choline enriched, some with choline poor diet.
[20] Liver cirrhosis

Reference	Animal	Strain or type	Sex	Preparation and dose	Site and route	Animals with tumors	Survival	Duration of experiment
35.--FERRIC CHLORIDE								
Boyland and Sargent, 1951	20 mice	Stock	----	0.01 & 0.05 molar in aqueous solution, 0.05 ml. in 40 sites	Intradermal	0	----	----
36.--FERROUS AMMONIUM SULFATE								
Boyland and Sargent, 1951	12 mice	Stock	----	0.05 molar in aqueous solution, 0.05 ml. in 12 sites	Intradermal	0	----	----
37.--FERROUS SULFATE								
Boyland and Sargent, 1951	10 mice	A, FAK	----	0.05 molar in aqueous solution, 0.05 ml. in 25 sites	Intradermal	0	----	at least 30 d.
38.--GALLIUM CHLORIDE								
Dudley and Levine, 1949	40 rats	----	----	10 - 1000 p.p.m. in the diet for 12 wks.	P.O.	0	40 alive at 13 wks.	13 wks.
39.--GOLD								
Nothdurft, 1955	Mice	----	----	12 discs implanted, 0.02 mm. thick, 12 mm. in diameter	Implantation[21]	3 sarc.	----	11 mos.
	rats	Wistar	----	12 discs implanted, 0.02 mm. thick, 17 mm. in diameter	Implantation[21]	9 sarc.	----	11 mos.
40.--HYDROCHLORIC ACID								
Korpassy and Mosonyi, 1950a	19 rats	White	----	5% solution	Skin[22]	0	10 alive at 300 d.	505 d.
Fazekas, 1953	5 rabbits	----	F	0.1 - 0.7 gm. per kg. dissolved in 50 - 100 cc. water, wice daily for 13 mos. (25% solution)	P.O.	0[1]	----	16 mos.
	rabbits	----	F	0.1 - 0.2 gm. per kg. body wt. dissolved in 100 - 150 cc. of water as a 25% solution, twice daily for 5 mos.	P.O.	0[1]	----	5 mos.
41.--HYDROGEN FLUORIDE								
Stokinger, et al., 1950b	20 rats	Albino	M	8 mg. per $m.^3$ daily, 124 exposure hrs.	Inhalation	0	----	1 mo.
	10 rats	Albino	M	8 mg. per $m.^3$ on alternate days (total 62 hrs. exposure)	Inhalation	0	----	1 mo.

[1] Pathology report "elsewhere".

[21] 6 discs placed individually, each through a distinct incision, beneath the dorsal skin; 4 were laid in the abdominal cavity and 2 beneath the ventral skin.

[22] To areas of ulceration following burning.

Reference	Animal	Strain or type	Sex	Preparation and dose	Site and route	Animals with tumors	Survival	Duration of experiment
42. --HYDROGEN PEROXIDE								
Boyland and Sargent, 1951	56 mice	B, CBA	----	0.01 - 0.5 molar in aqueous solution, 0.05 ml. in 8 - 58 sites	Intradermal	0	----	at least 54 d.
43. --HYDROXYLAMINE								
Boyland and Sargent, 1951	12 mice	Stock	----	0.05 molar in aqueous solution, 0.05 ml. in 12 sites	Intradermal	0	----	at least 32 d.
44. --LANTHANUM ACETATE								
Boyland and Sargent, 1951	4 mice	FAK IX	----	20 mg. per ml. in water, 0.05 ml. of solution in 16 sites	Intradermal	0	----	at least 40 d.
45. --LEAD ACETATE								
Germuth and Eagle, 1948	29 rabbits	----	----	240 - 120 mg. per kg. aqueous solution daily for 5 d. per wk. (total dose 600 - 1200 mg. per kg.)	S.C.	0	26 d. average	40 d.
Chiodi and Cardeza, 1949	61 rats	----	----	2 cc. of a 4.5% solution in water daily[22a]	P.O.[23]	0	several died early	52 d.
Beijers, 1952	1 horse	----	----	5 g. per day	P.O.	0	----	at least 2 mos.
	1 calf	----	----	1-3 g. per day	P.O.	0	----	at least 3 yrs.
Pardoe, 1952	4 rats	Albino	M	35 mg. lead per 100 gm., 3 times weekly for 72 d.	P.O.[23]	0	----	135 d.
Pardoe and Weatherall, 1952	rats	Albino	M	29 doses - 13.3 M. equiv. per kg. doses	P.O.[23]	0	----	98 d.
Schmid et al., 1952	5 rabbits	----	----	100 mg. per kg. body wt.	S.C.	0	sacrified at various times	44 d.
De Rosa, 1953	8 rabbits	----	----	0.2 g. every other day. 4 received an addition of α-tocopherol, 0.2 g. every 4 d. I.M.	P.O.	0	----	37 d.
Ottaviana and L'Abbate, 1953	10 guinea pigs	----	----	4 mg. per kg. body wt. daily	S.C.	0	----	40 d.
	10 guinea pigs	----	----	50 mg. to 0.4 g. per kg. body wt., daily	P.O.[23]	0	----	60 d.
46. --LEAD ACETATE, BASIC								
Beijer, 1952	1 calf	----	----	1-3 g. per d.	P.O.	0	----	at least 2 yrs.
LEAD CARBONATE (See under LEAD CHLORIDE)								

[22a] Various diets used.

[23] Stomach tube.

Reference	Animal	Strain or type	Sex	Preparation and dose	Site and route	Animals with tumors	Survival	Duration of experiment
47.--LEAD CHLORIDE								
Weatherall and Comfort, 1952	rabbits	----	----	13.7 mg. per kg. I.V. and then 250 mg. lead carbonate in the diet for 4 mos.	I.V. & P.O.	0	----	4 mos.
48.--LEAD NITRATE								
Beijers, 1952	1 calf	----	----	100 mg. per liter of water	P.O.	0	----	at least 4 mos.
Pirrie, 1952	18 guinea pigs[23a]	----	M	0.2% solution in water, 100 mg. daily	P.O.	0	3 died by 50 d.	150 d.
49.--LEAD SULFIDE								
Beijers, 1952	1 calf	----	----	1-3 g. per day	P.O.	0	----	at least 2 yrs.
50.--LITHIUM CHLORIDE								
Radomski et al., 1950	2 dogs	----	----	100 mg. per kg. daily in capsules of 25% soln.	P.O.	0	----	42 d.
	4 dogs	----	----	20 or 50 mg. per kg. daily, 25% soln. in capsules	P.O.	0	all alive at 150 d.	over 150 d.
	2 dogs	----	----	20 mg. per kg., 25% soln. in capsules (low sodium diet)	P.O.	0	----	30 d.
51.--MERCURIC ACETATE								
Fitzhugh et al., 1950b	rats	----	M&F	0.5 - 160 p.p.m.	P.O.	0	----	2 yrs.
52.--MERCURY								
Ashe at al., 1953	18 rabbits	----	----	1 mg. per $m.^3$ air, 7 hrs. per d. 83 wks.	Inhalation	0	5 alive at 54 wks.	83 wks.
	rabbits	----	----	8.6 mg. per 10 $m.^3$ air, 7 hrs. per d. for 12 wks.	Inhalation	0	killed at various intervals	19.5 wks.
	16 rabbits	----	----	60 mg. per 10 $m.^3$ air, 7 hrs. per d. for 11 wks.	Inhalation	0	killed at various intervals	12 wks.
	25 rats	----	----	1 mg. per $m.^3$ air, 7 hrs. per d., for 72 wks.	Inhalation	0	----	72 wks.
	2 dogs	----	----	1 mg. per $m.^3$ air, 7 hrs. per d., for 83 wks.	Inhalation	0	1 died at 61 wks.	83 wks.

[23a] 12 Splenectomized at different times.

Reference	Animal	Strain or type	Sex	Preparation and dose	Site and route	Animals with tumors	Survival	Duration of experiment
53.--NICKEL								
Phatak and Patwardhan, 1950	2 monkeys	Macacus sinicus	----	25 - 100 g. catalyzed nickel in diet	P.O.	0	----	24 wks.
	24 rats	----	----	25 - 100 g. catalyzed nickel in diet	P.O.	0[24a]	----	8 wks.
Hueper, 1951	70 rats	----	----	0.05 cc. of a 25% suspension in lanolin, 1, 2 or 5 injs. of 0.1 cc. of a 12.5% suspension in lanolin	Inj. femur cavity, nasal sinuses, pleural cavity	10[23b]	55 alive at 6 mos.	at least 6 mos.
Hueper, 1952b	20 rats	Osborne Mendel	F	0.1 cc. of 12.5% suspension in lanolin, 3 injs. over 2 mos.	Inj. nasal sinus	tumors[25]	14 alive at 7 mos.	16 mos.
	25 rats	Osborne Mendel	F	Metal powder (50 mg.) in 0.05 cc. lanolin monthly - 5 times.	Inj. pleural cavity	tumors[24]	10 alive at 7 mos.	16 mos.
	25 rats	Osborne Mendel	F	Metal powder in lanolin, 0.05 cc. containing 50 mg.	Inj. right femur (marrow cavity)	tumors[26]	17 alive at 7 mos.	16 mos.
Phatak and Patwardhan, 1952	42 rats	----	----	25 mg. per 100 gms. in diet	P.O.	0[24a]	sacrificed at intervals	16 mos.
	24 rats	----	----	25 mg. per 100 g. catalyzed nickel in diet	P.O.	0[24a]	sacrificed at intervals	8 mos.
54.--NICKEL CARBONATE								
Phatak and Patwardhan, 1950	24 rats	----	M&F	25 - 100 mg. (nickel) per 100 g. diet	P.O.	0	----	At least 3 mos.
	6 monkeys	Macacus sinicus	----	25 - 100 mg. (nickel) per 100 g. diet	P.O.	0	2 died	At least 6 mos.
55.--NICKEL CARBONYL								
Barnes and Denz, 1951a	Rats	Albino	----	5 - 30 minute exposures (17-70 mg. per $m.^3$ x 10^3 min.)	Inhalation	0	----	over 3 mos.
	Rabbits	----	----	5 - 30 minute exposures (17-37 mg. per $m.^3$ x 10^3 min.)	Inhalation	0	----	over 3 mos.
Kincaid et al., 1953	5 mice	----	----	0.016 mg. per liter increasing to 0.19 mg. per liter, 10 exposures	Inhalation	0	2 died in 48 d.	48 d.
	6 rats	----	----	0.083 mg. per liter, 0.54 mg. per liter, 10 exposures	Inhalation	0	1 died in 48 d.	48 d.
	1 cat	----	----	0.50 mg. per liter increasing to 1.95 mg. per liter, 6 exposures	Inhalation	0	----	125 d.

[23b] Sarcoma at site of injection.
[24] 4 Sarcomas at site of injection.
[24a] No pathological data.
[25] Sarcoma in mediastinal and abdominal lymph nodes.
[26] 3 osteogenic sarcomas, and 1 squamous cell carcinoma, at site of injection. 1 round cell sarcoma in the abdominal cavity.

Reference	Animal	Strain or type	Sex	Preparation and dose	Site and route	Animals with tumors	Survival	Duration of experiment
56.--OSMIUM TETROXIDE								
Masturzo, 1950	8 guinea pigs	----	----	50 mg. in aqueous solution, 8 hrs. per day, for 60 d.	Inhalation	0	Killed at 45 - 60 d.	60 d.
57.--PHOSPHORUS (Yellow)								
Schmahl and Mecke (Unpub. data)	25 rats	Hybrids	----	10 - 45 μg. daily (total dose 13 mg.) orally	P.O.	0	22 alive after 1 yr.	33 mos.
58.--PLATINUM								
Nothdurft, 1955	Rats	Wistar	----	12 discs implanted, 0.02 mm. thick, 17 mm. in diameter	Implantation[21]	4 sarc.	----	up to 11 mos.
	Mice	----	----	12 discs implanted, 0.02 mm. thick, 12 mm. in diameter	Implantation[21]	6 sarc.	----	up to 11 mos.
59.--POTASSIUM DICHROMATE								
Plum, 1951	Rabbits	----	----	1 mg. per kg. daily	I.V.	0	----	35 d.
Bauer et al, 1953	1 rabbit	White	M	10 mg. per ml. (total dose 10-60 mg.)	I.V.	0	----	7 wks.
60.--POTASSIUM THIOCYANATE								
Manjon, 1947	Dogs	----	----	5% daily in Ringer's solution (25 - 50 mg. per kg. body wt., single dose)	I.V.	0[26a]	----	at least 5 wks.
61.--SELENIUM								
Hall et al., 1951	10 rats	Albino	M	Powdered, 25 mg. per ml. in 1% aqueous gum arabic solution, 200-1000 mg. per kg. body wt.	I.P.	0	9	3 mos.
Hendrick et al., 1953	26 rats	Sprague-Dawley	M&F	10 p.p.m. in the diet	P.O.	0[26a]	34%	60 d.
62.--SILICON DIOXIDE[27a]								
Carminati and Chirico, 1951a	8 rats	----	M	1.5% in saline, 1 ml.	S.C.[27]	0	----	120 d.
Curran, 1953	guinea pigs	----	----	200 mg. (quartz dust)	I.P.	0	killed at intervals	115 d.
Druckrey and Schmahl, 1954a	29 rats	BD I, BD III, Wistar	----	ca. 100 mg. daily (total dose ca. 100 mg.) (quartz dust)	I.P. & S.C.	4[28]	23 alive after 1 yr.	33 mos.

[21] 6 discs placed individually, each through a distinct incision, beneath the dorsal skin, 4 were laid in the abdominal cavity and 2 beneath the ventral skin.

[26a] Pathology not discussed.

[27] In both inquinal regions.

[27a] SiO_2.

[28] Sarcomas in the abdomen after 16 - 26 months. Etiology considered certain.

Reference	Animal	Strain or type	Sex	Preparation and dose	Site and route	Animals with tumors	Survival	Duration of experiment
63. --SILVER								
Nothdurft, 1955	rats	Wistar	----	12 discs implanted, 0.02 mm. thick, 17 mm. in diameter	Implantation[21]	5 sarc.	----	up to 11 mos.
	mice	----	----	12 discs implanted, 0.02 mm. thick, 12 mm. in diameter	Implantation[21]	1 sarc.	----	up to 11 mos.
64. --SODIUM ACETATE								
Pardoe, 1952	4 rats	Albino	M	35 mg. per 100 gm. 3 times weekly for 63 d., 140 mg. per 100 gm. 3 times weekly for 72 d.	P.O.[23]	0	----	135 d.
Pardoe and Weatherall, 1952	rats	Albino	M	20 doses - 13.3 m. equiv. per kg. doses	P.O.[23]	0	----	98 d.
65. --SODIUM AMMONIUM PHOSPHATE								
Fazekas, 1953	rabbits	----	F	0.1 - 0.2 gm. per kg. body wt. dissolved in 100 - 150 cc. of water, twice daily for 5 mos.	P.O.	0[1]	----	5 mos.
	5 rabbits	----	F	0.1 - 0.7 gm. per kg. dissolved in 50 - 100 cc. of water, twice daily for 13 mos.	P.O.	0[1]	----	16 mos.
66. --SODIUM ARSENITE								
Boyland and Sargent, 1951	8 mice	C57	----	1.0 mg. per ml. in water, 0.05 ml. of solution in 32 sites	Intradermal	0	----	----
67. --SODIUM CHLORIDE								
Meneely et al., 1952	193 rats	Sprague-Dawley	M	0.01 - 9.8% in the diet	P.O.	0	17 died	20 wks.
Meneely et al., 1953a	150 rats	Sprague-Dawley	M	2.8 - 9.8% in the diet	P.O.	0	most alive at 9 mos.	over 9 mos.
Meneely et al., 1953b	150 rats	Sprague-Dawley	M	2.8 - 9.8% in the diet	P.O.	0	----	14 mos.
Paver et al., 1953	6 chicks	L.S. x R.I.R.	----	1.96 - 50% in the diet	P.O.	0	2 alive at 5 mos.	5 mos.
68. --SODIUM DIHYDROPHOSPHATE								
Fazekas, 1953	5 rabbits	----	F	0.1 - 0.7 gm. per kg. body wt. dissolved in 50 - 100 cc. of water, twice daily for 13 mos.	P.O.	0[1]	----	16 mos.
	rabbits	----	F	0.1 - 0.2 gm. per kg. body wt. dissolved in 50 - 100 cc. of water, twice daily for 5 mos.	P.O.	0[1]	----	5 mos.

[1] Pathology report "elsewhere".

[21] 6 discs placed individually, each through a distinct incision, beneath the dorsal skin; 4 were laid in the abdominal cavity and 2 beneath the ventral skin.

[23] Stomach tube

Reference	Animal	Strain or type	Sex	Preparation and dose	Site and route	Animals with tumors	Survival	Duration of experiment
69. --SODIUM FLUORIDE								
Bond and Murray, 1952	Rats	----	----	5 - 15 mg. per d.	P.O.	0[28a]	----	20 mos.
Fleming, 1953	41 mice	dba	M&F	0.0013% or 0.002% in water[15]	P.O.	0	----	100 d. or 55 d.
	61 guinea pigs	----	M&F	0.0013% or 0.002% in water[15]	P.O.	0	----	55 d. or 90 d.
	24 guinea pigs	----	M&F	0.15 cc. of 0.1% aqueous soln. for 25 injections[15]	I.P.	0	----	45 d.
Kono, 1953	Rabbits	----	----	30 - 140 mg. per kg. for 30 - 200 d.	P.O.	0	Sacrificed at various intervals	At least 200 d.
Miller and Phillips, 1953	36 rats	Holtzman	F	0.1% in the diet for 6 wks. (450 p.p.m. fluorine)	P.O.	0	Sacrificed at various intervals	32 wks.
Odell and Key, 1953	85 rats	Albino	----	226 p.p.m. in water (approx. 4 mg. per day)[29]	P.O.	0	Some died of infection	7 wks.
Ogilvie, 1953	Rats	Long Evans	----	As isotonic aqueous soln. every other day (total of 1131 mg. of the salt)	I.P.	0	----	100 d.
Radike and Muhler, 1953	7 hamsters	----	M&F	10 μg. fluoride per ml. in water	P.O.	0[29a]	----	60 d.
70. --SODIUM IODATE								
Murray, 1953	Rabbits	----	----	1 - 100 mg. per kg. body wt. biweekly for 6 wks.	P.O.	0	66% died at 100 mg.	6 wks.
	7 rabbits	----	M&F	1 mg. per kg. body wt. biweekly[30]	P.O.	0	2 killed at 4 mos.	8 mos.
71. --SODIUM MOLYBDATE								
Arrington and Davis, 1953	31 rabbits	Dutch	M&F	0.014 - 0.4% in the diet	P.O.	0[31]	Several died at levels above 0.1%	4 mos.
72. --SODIUM NITRITE								
Njaa and Braekkan, 1953	6 rats	----	M&F	0.5 - 2 mg. in water per day	P.O.	0	----	12 wks.
	39 rats	----	M&F	0.1 - 0.8 mg. per kg. in water	P.O.	0	----	10 wks.
	60 rats	----	M&F	28 - 105 mg. (total dose) in nitrite-preserved herring meal	P.O.	0	----	10 wks.

[15] Plus transplant of tooth germs.
[28a] Few pathological details.
[29] With experimental fracture of humerus.
[29a] Only teeth examined.
[30] Offspring fed for 14 months with no ill-effects noted.
[31] No autopsy data.

Reference	Animal	Strain or type	Sex	Preparation and dose	Site and route	Animals with tumors	Survival	Duration of experiment
73. --SODIUM SELENATE								
Sellers et al., 1950	40 rats	----	F	20 p.p.m. in the diet for 8 wks. (various diets)	P.O.	0	----	8 wks.
	40 rats	----	F	20 p.p.m. in the diet	P.O.	0[32]	----	8 wks.
74. --SODIUM SELENITE								
Vesce, 1948	5 dogs	----	----	1 mg. per 20 cc. water, aqueous soln. (total dose per animal 0.5 mg. per kg. body wt.)	P.O.[23]	0	4 died after 40 - 70 d.	At least 70 d.
	5 guinea pigs	----	----	1 mg. per 100 cc. water, aqueous soln. (total dose per animal 0.5 mg. per kg. body wt.)	P.O.	0	40 d. avg.	At least 40 d.
Fimiani, 1951	8 rabbits	----	M	0.05 gm. in 1000 cc. distilled water for 60 d. (increasing doses, 1 - 10 cc. per animal)	----	0[31b]	----	At least 60 d.
	8 rabbits	----	----	0.005 gm. per 100 cc. distilled water (daily doses 1 - 10 cc.)	----	0[31b]	5 alive at 63 d.	63 d.
75. --STANNOUS FLUORIDE								
Muhler et al., 1953	151 rats	----	M&F	0.36 mg. % fluorine for 140 d. in diet	P.O.	0[31b]	----	140 d.
Radike and Muhler, 1953	7 hamsters	----	M&F	10 μg. per ml. in drinking water	P.O.	0[29a]	----	60 d.
76. --STRONTIUM CHLORIDE								
Banks et al., 1951	5 rats	Wistar	----	1% in drinking water	P.O.	0	----	45 d.
	6 rats	Wistar	----	2% in drinking water	P.O.	0	----	53 d.
77. --STRONTIUM SULFATE								
Carminati and Chirico, 1951b	8 rats	----	M	0.5% in saline, 1 ml.	S.C.[27]	0	----	120 d.
78. --TELLURIUM DIOXIDE								
DeMeio and Jetter, 1948	6 rats	Hisaw	----	375 - 1500 p.p.m. in diet	P.O.	0	2 died after 26 d.	128 d.
79. --THORIUM DIOXIDE[31a]								
Roussy et al., 1934	10 rats	----	----	1 cc. every 304 d., 5 inj.	Abdominal cavity	4 sarc.[32a]	----	12 - 18 mos.
	5 rats	----	----	1 cc. every 304 d., 5 inj.	S.C.	4 sarc.	----	18 mos.

[23] Stomach tube.
[27] In both inguinal regions.
[29a] Only teeth examined.
[31a] Thorotrast used.
[31b] No pathology reported.
[32] Liver damage and some "nodules".
[32a] Of the peritoneum.

Reference	Animal	Strain or type	Sex	Preparation and dose	Site and route	Animals with tumors	Survival	Duration of experiment
79.--THORIUM DIOXIDE[31a]--Continued								
Onufrio, 1938	6 rabbits	----	----	6 cc. per kg. body wt.	I.V.	1 sarc.[32b]	----	2 yrs.
80.--VANADIUM PENTOXIDE								
Mountain et al., 1953	10 rats	Wistar	M	25 - 100 or 150 p.p.m. in the diet	P.O.	0	----	103 d.
	10 rats	Wistar	M	500 and 1000 p.p.m. in the diet	P.O.	0	----	75 d.
81.--ZINC								
Berfenstam, 1950a, b	Rabbits	----	----	Daily (form not stated) (Level of zinc in blood plasm 10-20 times normal)	P.O.	0[33]	----	10 wks.
	Rabbits	----	F[33a]	Daily (form not stated) (Level of zinc in blood plasm 10-20 times normal)	P.O.	0[33]	----	At least 4 wks.
82.--ZINC BERYLLIUM SILICATE								
Barnes, 1948	rabbits	----	----	Suspension	I.V.	tumors[11]	----	over 8 mos.
Cloudman et al., 1949	mice	----	----	8.36 mg. zinc and 0.264 beryllium, total dose, semi-weekly in 20-22 inj.	I.V.	tumors[34]	----	----
	rabbits	----	----	550 mg. zinc and 17 mg. beryllium, total dose, semi-weekly in 20-22 inj.	I.V.	tumors[35]	80% alive at 1 yr.	at least 1 yr.
Barnes et al., 1950	34 rabbits	mixed breeds	M&F	1 ml. aqueous 10-30% suspension, 10-6 inj. (total dose 1.0 - 2.1 g.)	I.V. ear vein	tumors[36]	Lived 16 - 120 wks.	at least 120 wks.
Hoagland et al., 1950	4 rabbits	----	M&F	1% suspension in saline, 5 cc. each day or every 4 days (total 1 gm. approx. 14% beryllium oxide)	I.V.	3[36a]	----	at least 2 yrs.
	6 rabbits	----	M&F	1% suspension in saline, 5 cc. each day or every 4 days (total 1 gm. approx. 2.3% beryllium oxide)	I.V.	3[36a]	----	at least 2 yrs.
Nash, 1950	rabbits	----	----	1% suspension, repeated inj.	I.V.	tumors[8 37]	----	----
Sisson, 1950a	rabbits	----	----	Aqueous suspension, 1 gm. total.	I.V.	tumors[38]	----	----
83.--ZINC CHLORIDE								
Carleton et al., 1952	fowls	----	M	---- ----	Intra-testicular	tumors[39]	----	----

[8] Osteogenic sarcomas.
[11] Multiple osteogenic sarcoma after 8 months.
[31a] Thorotrast used.
[32a] Of the peritoneum.
[32b] Of the spleen, lymph nodes and lungs.
[33] No increase in the zinc content of blood corpuscles.
[33a] Pregnant and nursing.
[34] Malignant bone tumors.
[35] Bone tumors.
[36] 6 Bone sarcomas.
[36a] Osteogenic sarcomas, 2 with metastases.
[37] In one case quoted a sarcoma developed after receiving 200 mg.
[38] Osteogenic sarcoma in a high proportion of long term survivors. Details in other publications.
[39] Mixed tumors classified as "teratomas".

Reference	Animal	Strain or type	Sex	Preparation and dose	Site and route	Animals with tumors	Survival	Duration of experiment
84. --ZINC NITRATE								
Plum, 1951	rabbits	----	----	10 ml. of a 4% solution daily	S.C.	0[40]	----	45 d.
85. --ZINC PHOSPHIDE								
Johnson and Voss, 1952	6 rats	Albino	----	0.02% in the diet	P.O.	0	----	58 d.
	12 rats	Albino	----	0.02 - 0.03% in diet	P.O.	0	8 died	1 mo.
86. --ZINC SILICATE								
Cloudman et al., 1949	mice	----	----	2.8 mg. of zinc in 20-22 semiweekly inj.	I.V.	0	----	at least 1 yr.
Barnes et al., 1950	10 rabbits	Mixed breeds	M&F	20% aqueous suspension of 1 ml., 10 inj. (total dose 1.2 g.)	I.V. ear vein	0	all alive at 120 wks.	at least 120 wks.
87. --ZINC SULFATE								
Thomas and Thiery, 1953	rabbits	----	M&F	10 ml. (1 mg. metal) daily for 5 d.	S.C.	tumors[16]	----	Unknown
	2 rabbits	----	F	10 ml. (1 mg. zinc) daily for 5 d.[17]	S.C.	2[18]	----	36 d.
	12 rats	----	----	2 ml. (0.2 mg. metal) daily for 5 d.	S.C.	0	----	----
	6 mice	----	----	1 ml. (0.1 mg. metal) daily for 5 d.	S.C.	0	----	----
88. --ZIRCONIUM CARBONATE								
Harrison et al., 1951	30 rats	Albino	M	0.5, 1.0 or 1.5 gm. per kg. as 10% aqueous hydrated zirconium carbonate, 2 doses at 10 d. interval	I.V.	0	30 alive at 30 d.	30 d.
89. --ZIRCONIUM CHLORIDE								
Harrison et al., 1951	60 rats	Albino	M&F	0.2 - 20.0% of the diet	P.O.	0	60 alive at 17 wks.	17 wks.
	6 cats	----	M&F	1 or 5% hydrated zirconium chloride in diet	P.O.	0	6 alive at 9 wks.	9 wks.

[16] Liposarcoma.
[17] Fattening diet of oats and bran for 9 months previous to experiment.
[18] Liposarcoma in lumbar region.
[40] Bone marrow hyperplasia.

Reference	Animal	Strain or type	Sex	Preparation and dose	Site and route	Animals with tumors	Survival	Duration of experiment
90.--ACETIC ACID CH_3COOH								
Fazekas, 1953	Rabbits	----	F	0.1 - 0.2 gm. per kg. body wt. dissolved in 100 - 150 cc. of water, twice daily for 5 mos.	P.O.	0[1]	----	5 mos.
	5 rabbits	----	F	0.1 - 0.7 gm. per kg. body wt. dissolved in 50 - 100 cc. drinking water, twice daily for 13 mos.	P.O.	0[1]	----	16 mos.
91.--ACETONE CH_3COCH_3								
Rigdon, 1952	9 duck	Pekin	----	Daily for 33 d.	Skin	0	5 alive at 88 d.	182 d.
92.--AEROSOL OT $\begin{matrix} COOC_8H_{17} \\ \vert \\ CH\text{-}SO_3Na \\ \vert \\ CH_2 \\ \vert \\ COOC_8H_{17} \end{matrix}$								
Fitzhugh and Nelson, 1948b	36 rats	Osborne-Mendel	M	0.25 to 1% in the diet	P.O.	0	30 alive at 1 yr.	2 yr.
	5 rats	Osborne-Mendel	M	8% in the diet	P.O.	0	All died in 1 wk.	16 wks.
	5 rats	Osborne-Mendel	M	4% in the diet	P.O.	0	1 alive 16 wks.	16 wks.
	5 rats	Osborne-Mendel	M	2% in the diet	P.O.	0	----	16 wks.
Hopper et al., 1949	10 mice	Harlan	M&F	0.48 gm. per kg. daily, 6 d. per wk.	P.O.	0	8 died	30 d.
93.--ALLYL FORMATE $HCOOCH_2CH=CH_2$								
Kessel et al., 1954	18 rabbits	----	----	20 - 40 mg. per kg.	S.C.	0	----	6 mos.
94.--ALUMINUM SODIUM LACTATE								
Plum, 1951	5 rabbits	----	----	100 mg. (calc. as aluminum) daily	S.C.	0[14]	----	50 d.
95.--AMMONIUM LACTATE $CH_3CHOHCOONH_4$								
Fazekas, 1953	5 rabbits	----	F	0.1 - 0.7 gm. per kg. dissolved in 50 - 100 cc. water, twice daily for 13 mos.	P.O.	0[1]	----	16 mos.
	Rabbits	----	F	0.1 - 0.2 gm. per kg. body wt. dissolved in 100 - 150 cc. water, twice daily for 5 mos.	P.O.	0[1]	----	5 mos.

[1] Pathology report "elsewhere".
[14] Spleen hyperplasia.

Reference	Animal	Strain or type	Sex	Preparation and dose	Site and route	Animals with tumors	Survival	Duration of experiment
96.--1, 3-BUTANEDIOL $HOCH_2CH_2CHOHCH_3$								
Kopf et al., 1950	60 rats	White	M	0.5 and 1 ml. per 100 g. (50% aqueous) twice a wk.	P.O.[23]	0	----	26 wks.
	2 dogs	----	M&F	2 ml. per kg. (50% aqueous) twice a wk.	P.O.[23]	0	----	5 mos.
97.--1, 2, 4-BUTANETRIOL $HOCH_2CHOHCH_2CH_2OH$								
Kopf et al., 1951	79 rats	Albino	M&F	0.5 and 1 ml. per 100 g. (50% aqueous) twice a wk.	P.O.[23]	0	----	152 d.
98.--BUTOXYPOLYPROPYLENE GLYCOL $CH_3(CH_2)_3O-[CH(CH_3)CH_2O-]_xH$								
Carpenter et al., 1951	30 rats	Sherman	M&F	1.48 - 0.12% in the diet (approx. mol. wt. 800)	P.O.	0	Many died of infection	90 d.
	10 rabbits	New Zealand	----	1.0 - 0.1 mg. per kg. per day, 5 d. per wk. for 6 wks. (approx. mol. wt. 400)	Skin	0	Some died at higher concentration	6 wks.
	8 rabbits	New Zealand	M	1.0 - 0.1 ml. per kg. per day, 5 d. per wk. for 18 wks. (approx. mol. wt. 800)	Skin	0	2 died	18 wks.
	30 rats	Sherman	M&F	4.0 - 0.25% in the diet (approx. mol. wt. 400)	P.O.	0	A few died early	90 d.
99.--N-n-BUTYL ETHYL CARBAMATE $CH_3(CH_2)_3NH-COOC_2H_5$								
Larsen, 1948	40 mice	A	M&F	0.5 mg. per gm. body wt. in tricaprylin once weekly for 13 wks.	I.P.	32%[41]	38 alive at 16 wks.	16 wks.
100.--t-BUTYL HYDROPEROXIDE $(CH_3)_3C-O-OH$								
Boyland and Sargent, 1951	40 mice	ABC & stock	----	0.27 and 0.55 molar in aqueous soln., 0.05 ml. in 40 or 108 sites	Intradermal	0	----	At least 40 d.
101.--n-BUTYLIDENE CHLORIDE $CH_3CH_2CH_2CHCl_2$								
Wenzel and Gibson, 1951	15 rats	Wistar	M	0.33 mg. per kg., 8 doses with 4 d. intervals	P.O.	0	----	32 d.
102.--n-BUTYL-d, 1-MALATE $CH_3(CH_2)_3OOC-CHOH-CH_2COO(CH_2)_3CH_3$								
Draize et al., 1948	50 mice	----	----	Undiluted, daily	Skin	0	----	90 d.

[23] Stomach tube.

[41] Pulmonary adenomas, mean number 0.5 (17% in the untreated control).

Reference	Animal	Strain or type	Sex	Preparation and dose	Site and route	Animals with tumors	Survival	Duration of experiment
103.--BUTYL STEARATE $CH_3(CH_2)_{16}COO(CH_2)_3CH_3$								
Smith, 1953	40 rats	Sprague-Dawley	M&F	6.25% in the diet for 10 wks.	P.O.	0	----	10 wks.
	90 rats	Sprague-Dawley	M	0.01 - 6.25% in the diet	P.O.	0	15 sacrificed at 1 yr.	2 yrs.
104.--n-BUTYRIC ACID $CH_3CH_2CH_2COOH$								
Salmon and Copeland, 1949b	4 rats	AES	----	25% in a synthetic diet for 3 to 35 wks.	P.O.	Tumors[42]	Several died early	35 wks.
105.--ϵ-CAPROLACTAM POLYMER $[-CONH(CH_2)_5-]_x$								
Druckrey and Schmahl, 1952	9 rats	BD 1	----	2 pieces of film-discs	I.P.	5[42a]	7 alive after 1 yr.	32 mos.
106.--CARBON DISULFIDE CS_2								
Carratala, 1951	Cats	----	----	1 or 2 mg. per liter air, 8 or 9 hrs per d.	Inhalation	0	All alive at 4 to 5 wks.	5 wks.
	Dog	----	----	Aqueous soln.	P.O.	0	Alive at 2 to 3 mos.	3 mos.
	Rabbit	----	----	Aqueous soln.	P.O.	0	Alive at 2 to 3 mos.	3 mos.
107.--CARBON TETRACHLORIDE CCl_4								
Sellers et al., 1948	50 rats	Wistar	F	20% soln. in corn oil, 0.2 ml., 2-3 times weekly for 4 mos. (various diets)	P.O.[23]	0[43]	Sacrificed at intervals	7 mos.
	Rats	Wistar	M	1000 p.p.m., 4 hrs. per d., 5 d. per wk. 25 - 35 exposures (various diets)	Inhalation	0[20]	164 survived exposures	12 wks.
Violante, 1948	8 rats	----	M	50% in mineral oil, 0.2 ml. per 100 gm. body wt. every 2 wks.	S.C.	0	----	1 yr.
De Dominicis, 1949	guinea pigs	----	----	3 to 4 cc. of vapor, daily exposure	Inhalation	0	3 died within 22 d.	55 d.
Furlong et al., 1949	6 guinea pigs	----	F	0.02 - 0.08 ml. in Wesson oil for 144 d., interval, then 16 d.	P.O.	0[20]	----	202 d.
Kretchmer and Barnum, 1949	mice	C3H	M	0.1 ml. of 40% olive oil solution for 200 d.	P.O.	tumors[44]	----	200 d.
Lee et al., 1949	53 mice	----	----	single or repeated feedings	P.O.	tumors[44]	killed at intervals	----

[20]-Liver cirrhosis
[23] Stomach tube.
[42] Some cases of papillomatosis of the forestomach.
[42a] Sarcomas in the abdomen after 12 to 24 months. Etiology considered certain.
[43] Cirrhosis in some animals.
[44] Hepatomas.

Reference	Animal	Strain or type	Sex	Preparation and dose	Site and route	Animals with tumors	Survival	Duration of experiment
				107.--CARBON TETRACHLORIDE $CC1_4$--Continued				
Sforzini, 1949	20 rats	----	----	20% in oil, 0.1 ml. 3 times weekly (2 different diets given)	P.O.[23]	0	16	37 d.
Rudali and Mariani, 1950	30 mice	XVII Ivry	----	0.1 ml. of a 40% solution in oil, 2 to 3 times weekly (48 times in 118 d.)	P.O.[23]	tumors[45]	9 alive at 66 d.	310 d.
Sellers et al., 1950	40 rats	----	F	0.2 cc. of a 20% solution in corn oil, 3 times weekly for 8 wks.	P.O.[23]	0[46]	----	8 wks.
	40 rats	----	F	0.2% of a 20% corn oil solution, 3 times weekly for 8 wks. (various diets)	P.O.[23]	0	----	8 wks.
Wilson et al., 1950	mice	----	----	----	----	tumors[47]	----	----
Grattarola, 1951	5 rats	----	F, Castr.	40% in olive oil, 0.5 ml. weekly for 5 wks.[48]	P.O.[23]	0[48a]	----	5 wks.
	5 rats	----	F, Castr.	40% in olive oil, 0.5 ml. weekly for 5 wks.	P.O.[23]	0[48a]	----	5 wks.
Highman and Eschenbrenner, 1951	50 mice	C3H	----	0.5% in olive oil twice weekly	P.O.[23]	12[44]	45 alive at 185 d.	143 to 185 d.
	80 mice	C3H	----	0.5% in olive oil twice weekly[49]	P.O.[23]	0	----	185 d.
Pierce and Gofman, 1951	rabbits	New Zealand white	F	1 cc. per kg. twice a wk, 11 inj.	S.C.	0	some died	10 wks.
Stowell et al., 1951	68 mice	A	M	0.1 cc. of 40% in olive oil twice weekly for varying periods	P.O.[23]	27[44]	some died early after findings	----
Ungar, 1951	45 rats	----	M	0.1 cc. per 100 gm. body wt., twice weekly, 50 inj.	S.C.	0	sacrificed at 40 - 60 d.	60 d.
Wenzel and Gibson, 1951	15 rats	Wistar	M	0.33 ml. per kg., 8 doses with 4 d. intervals	P.O.	0	----	32 d.
Adams et al., 1952	16 guinea pigs	----	M&F	400 p.p.m. air, up to 168 seven hour exposures daily	Inhalation	0[50]	most died in 4 wks. 2 survived 232 d.	232 d.
	30 rats	Wistar	M&F	400 p.p.m. air, 127 seven hr. exposures daily	Inhalation	0[50]	9 alive at 173 d.	173 d.
	44 rats	Wistar	M&F	100 - 400 p.p.m. air, 33 - 67 exposures of either 0.3, 0.1 or 0.05 hrs. daily	Inhalation	0[50]	----	94 d.
	30 rats	Wistar	M&F	200 p.p.m. air, up to 138 seven hr. exposures daily	Inhalation	0[50]	15 alive at 192 d.	192 d. d.
	30 rats	Wistar	M&F	100 p.p.m. air, up to 146 seven hr. exposures daily	Inhalation	0[50]	----	205 d.

[23] Stomach tube.
[44] Hepatomas.
[45] 5 liver adenomas, 4 malignant.
[46] Fibrosis and necrosis of the liver and some "nodules".
[47] Cirrhosis and hepatomas.
[48] Associated with tube feeding of amino acids and Vitamin B.
[48a] No pathology reported.
[49] Choline deficient diet.
[50] Cirrhosis and fatty degeneration of the liver.

Reference	Animal	Strain or type	Sex	Preparation and dose	Site and route	Animals with tumors	Survival	Duration of experiment
107.--CARBON TETRACHLORIDE CCl_4--Continued								
Adams et al., 1952	16 guinea pigs	----	M&F	200 p.p.m. air, up to 184 seven hr. exposures daily	Inhalation	0[50]	4 alive at 252 d.	252 d.
	16 guinea pigs	----	M&F	100 p.p.m. air, up to 167 seven hr. exposures daily	Inhalation	0[50]	5 alive at 232 d.	232 d.
	rabbits	Albino	M&F	100 p.p.m. air, up to 149 seven hr. exposures daily	Inhalation	0[50]	3 alive at 210 d.	210 d.
	monkeys	Rhesus	----	100 p.p.m. air, up to 163 seven hr. exposures daily	Inhalation	0[50]	2 alive at 232 d.	232 d.
	30 rats	Wistar	M&F	50 p.p.m. air, 134 seven hr. exposures daily	Inhalation	0[50]	----	187 d.
	16 guinea pigs	----	M&F	50 p.p.m. air, 143 seven hr. exposures daily	Inhalation	0[50]	----	200 d.
	rabbits	Albino	M&F	50 p.p.m. air, 155 seven hr. exposures daily	Inhalation	0[50]	4 alive at 216 d.	216 d.
	Monkeys	Rhesus	M&F	50 p.p.m. air, 198 seven hr. exposures daily	Inhalation	0	2 alive at 277 d.	277 d.
	30 rats	Wistar	M&F	25 p.p.m. air, 137 seven hr. exposures daily	Inhalation	0[51]	----	191 d.
	5 guinea pigs	----	M	25 p.p.m. air, 133 seven hr. exposures daily	Inhalation	0[50]	----	185 d.
	5 guinea pigs	----	F	25 p.p.m. air, 93 seven hr. exposures daily	Inhalation	0[50]	----	126 d.
	Rabbits	Albino	M&F	25 p.p.m. air, 178 seven hr. exposures daily	Inhalation	0[50]	4 alive at 248 d.	248 d.
	Monkeys	Rhesus	---	25 p.p.m. air, 148 seven hr. exposures daily	Inhalation	0	1 alive at 212 d.	212 d.
	40 rats	Wistar	M&F	10 p.p.m. air, 136 seven hr. exposures daily	Inhalation	0[51]	----	192 d.
	16 guinea pigs	----	M&F	10 p.p.m. air, 139 seven hr. exposures daily	Inhalation	0[51]	----	197 d.
	Rabbits	Albino	M&F	10 p.p.m. air, 139 seven hr. exposures daily	Inhalation	0	4 alive at 197 d.	197 d.
	48 rats	Wistar	M&F	5 p.p.m. air, 145 seven hr. exposures daily	Inhalation	0	----	205 d.
	18 guinea pigs	----	M&F	5 p.p.m. air, 143 seven hr. exposures daily	Inhalation	0	----	203 d.
Bardawill and Gornall, 1952	25 dogs	Mongrel	M&F	15 ml. x 2 weekly of a 33% V/V corn oil soln.	P.O.[23]	0	----	3 yrs.
Hove and Hardin, 1952	48 rats	Sprague-Dawley	M	0.05 ml. in olive oil weekly for 8 wks. (various diets)	P.O.	0[52]	----	8 wks.
Aterman and Ahmad, 1953	11 rats	Albino	M	0.2 ml., 21 inj. in 7.5 wks.	S.C.	0	----	9 wks.

[23] Stomach tube.
[50] Cirrhosis and fatty degeneration of the liver
[51] Fatty degeneration of the liver.
[52] Some cirrhosis.

Reference	Animal	Strain or type	Sex	Preparation and dose	Site and route	Animals with tumors	Survival	Duration of experiment
107. --CARBON TETRACHLORIDE CCl_4--Continued								
Bergol'ts, 1953	mice	C57	----	0.04 cc., 2 inj. per wk.	S.C.	Tumors[53]	----	----
Ferroni and Bernardini, 1953	Rats	----	----	25% in almond oil, 0.2 ml. twice weekly (6 groups with various diets)	Injected	0	----	50 d.
108. --3-(α-CARBOXYETHYL-α-THIOMERCURI)-2-METHOXYPROPYLUREA $H_2N-CO-NH-CH_2CH(OCH_3)CH_2-Hg-S-CH(CH_3)COOH$								
Handley et al., 1951	10 dogs	----	----	Equivalent of 1 mg. Hg. per kg., 3 times weekly	I.V.	0	----	4 mos.
	15 dogs	----	----	0.25 mg. per kg. and 0.7 mg. per kg. 3 times weekly or 2 mg. per kg. 2 times weekly	I.V.	0	Sacrificed at 1, 3 & 8 mos.	9 mos.
109. --3-CARBOXYMETHYLTHIOMERCURI-2-METHOXYPROPYLUREA $H_2N-CO-NH-CH_2CH(OCH_3)CH_2-Hg-S-CH_2COOH$								
Handley et al., 1951	10 dogs	----	----	Equivalent of 1 mg. Hg. per kg. 3 times weekly	I.V.	0	----	4 mos.
Handley et al., 1953	15 dogs	----	----	0.25 mg. per kg. or 0.7 mg per kg. 3 times weekly or 2 mg. per kg. 2 times weekly	I.V.	0	Sacrificed at 1, 3 & 8 mos.	9 mos.
110. --CETYL DIMETHYL ETHYL AMMONIUM BROMIDE $CH_3(CH_2)_{15}(CH_3)_2(C_2H_5)NBr$								
Hooper et al., 1949	10 mice	Harlan	M&F	0.060 gm. per kg. daily, 6 d. per wk.	P.O.	0	8 died	30 d.
111. --1-CHLORO-1, 1-DIFLUOROETHANE CH_3CClF_2								
Lester and Greenberg, 1950	5 rats	White	----	1%, 16 hrs. exposure daily for 2 mos.	Inhalation	0	100%	2 mos.
112. --β-CHLOROETHYL CARBAMATE $H_2N-COOCH_2CH_2Cl$								
Larsen, 1947	mice	A	----	----	Inj.	tumors[54]	----	----
113. --CHLOROFORM $CHCl_3$								
Deringer et al., 1953	72 mice	C3H	M&F	5 mg. per liter of air for 1, 2 or 3 hrs.	Inhalation	0	many died early	18 mos.
114. --3-CHLOROMERCURI-2-METHOXYPROPYLUREA $H_2N-CO-NHCH_2CH(OCH_3)CH_2HgCl$								
Handley et al., 1951	10 dogs	----	----	Equivalent of 10 mg. Hg. per kg. 3 times weekly	I.V.	0	----	4 mos.
	15 dogs	----	----	0.25 mg. per kg. or 0.7 mg. per kg. 3 times weekly or 2 mg. per kg. 2 times weekly	I.V.	0	sacrificed at 1, 3 & 8 mos.	9 mos.

[53] Hepatomas in 78.9% of mice living 100 days or longer and 100% of mice living 150 days or longer. All had cirrhosis as well.

[54] Of the lung.

Reference	Animal	Strain or type	Sex	Preparation and dose	Site and route	Animals with tumors	Survival	Duration of experiment
115. --COBALT CYSTEINE COMPLEX[54a]								
Orten and Bucciero, 1948	10 rats	Albino	M	equivalent of 0.5 mg. of cobalt daily	S.C.	0	----	10 wks.
116. --COPPER SODIUM TARTRATE								
Plum, 1951	rabbits	----	----	2 ml. of a 0.02% solution in saline	I.V.	0	----	35 d.
117. --DECAMETHYLENE-1, 10-BIS-TRIMETHYLAMMONIUM IODIDE $(CH_3)_3\overset{I}{N}(CH_2)_{10}\overset{I}{N}(CH_3)_3$								
Paton and Zaimis, 1949	3 rabbits	----	----	100 μg. 6 times per wk. for 6.5 wks.	I.V.	0	----	6.5 wks.
	3 cats	----	----	30 μg. 6 times per wk. for 5 wks.	I.V.	0	----	5 wks.
118. --DIBUTOXYETHYL DIGLYCOL CARBONATE $O(CH_2CH_2OCOOCH_2CH_2OC_4H_9)_2$								
Mallette and von Hamm, 1952	6 rats	----	----	6 gm. per kg. minimum dosage	I.P.	0	----	1 mo.
119. --DI-(BUTYL CELLOSOLVE) AZELATE $(CH_2)_7[COOCH_2CH_2O(CH_2)_3CH_3]_2$								
Mallette and von Hamm, 1952	6 rats	----	----	6 gm. per kg. minimum dosage	I.P.	0	----	1 mo.
120. --N, N-DI-n-BUTYL ETHYL CARBAMATE $[CH_3(CH_2)_3]_2N\text{-}COOC_2H_5$								
Larsen, 1948	50 mice	A	M&F	0.5 mg. per gm. body wt. in tricaprylin, once weekly for 13 wks.	I.P.	0[55]	49 alive at 16 wks.	16 wks.
121. --DIBUTYL SEBACATE $(CH_2)_8[COO(CH_2)_3CH_3]_2$								
Smith, 1953	40 rats	Sprague-Dawley	F	0.01 - 1.25% in the diet	P.O.	0	----	1 yr.
	40 rats	Sprague-Dawley	M&F	6.25% in the diet for 10 wks.	P.O.	0	----	10 wks.
	90 rats	Sprague-Dawley	F	0.01 - 6.25% in the diet	P.O.	0	15 sacrificed at 1 yr.	2 yrs.
122. --DI-(2-CHLOROETHYL)-AMINE HYDROCHLORIDE $NH(CH_2CH_2Cl)_2 \cdot HCl$								
Boyland and Horning, 1949	20 mice	stock	----	1 mg. per 10 ml. aqueous, 1.0 mg. per kg. body wt. weekly for 50 wks.	S.C.	7[56]	11 alive at 280 d.	580 d.

[54a] Ratio of cobalt: cysteine = 1:3.

[55] 20% Pulmonary adenomas; mean number 0.2 (17% in the untreated controls).

[56] 1 Lymphosarcoma in liver, 2 lung adenomas, 3 lung carcinomas, 1 uterine fibromyoma.

Reference	Animal	Strain or type	Sex	Preparation and dose	Site and route	Animals with tumors	Survival	Duration of experiment
123. --β,β'-DICHLORODIETHYL SULFIDE $(ClCH_2CH_2)_2S$								
Fell and Allsopp, 1948	10 mice	----	----	50 μg. per cc. in acetone, 0.05 cc., 5 times weekly	Skin	0	7 alive at 280 d.	371 d.
	11 mice	----	----	250 μg. per cc. in acetone, 0.05 cc., 5 times weekly.	Skin	0	6 alive at 273 d.	371 d.
Berenblum and Shubik, 1949a	50 mice	Swiss (MRC)	F	0.1% in mineral oil, 1 or 3 applications (weekly intervals), followed after 3 wks. by 5% croton oil in mineral oil for 25 wks.	Skin	0	----	31 wks.
Heston, 1950a	mice	A	----	0.25 cc. of a 0.06% solution in water, 4 inj.	S.C.	tumors[57]	----	----
Heston, 1950b	30 mice	A	M&F	0.025 cc. of a 1:10 dilution of saturated solution in distilled water (0.06 - 0.07%) 4 injections	I.V.	14[58]	15 alive at 16 wks.	16 wks.
	48 mice	A	M&F	0.025 cc. of 1:10 dilution of 0.06 - 0.07% solution in distilled water, 4 injections	I.V.	32[58a]	47 alive at 16 wks.	16 wks.
Boyland and Sargent, 1951	20 mice	B	----	0.4 mg. per ml. in arachis oil, 0.05 ml. of solution in 1, 2 or 4 sites	Intradermal	0	----	at least 56 d.
	10 mice	B	----	0.4 mg. per ml. in propylene glycol, 0.05 ml. of solution in 1, 2 or 4 sites	Intradermal	0	----	----
	10 mice	B	----	0.4 mg. per ml. in water, 0.05 ml. of solution in 1, 2 or 4 sites	Intradermal	0	----	----
Heston, 1953	38 mice	C3Hf	M	0.05 cc. of 0.05% solution in olive oil, 6 inj.	S.C.	tumors[59]	16.8 mos. avg.	over 18.5 mos.
	26 mice	A	M&F	0.05 cc. of a 0.05% solution in olive oil, 5 inj.	S.C.	tumors[60]	8.9 mos. avg.	over 14.6 mos.
	16 mice	C3H	M&F	0.05 cc. of a 0.5% solution in olive oil, 6 inj.	S.C.	tumors[61]	11.6 mos. avg.	over 15.5 mos.
	9 mice	C3Hf	F	0.05 cc. of a 0.05% solution in olive oil, 6 inj.	S.C.	tumors[62]	15.4 mos. avg.	over 18 mos.
	24 mice	C3H	M	0.05 cc. in 0.05% solution in olive oil, 6 inj.	S.C.	tumors[63]	13.1 mos. avg.	over 19.6 mos.
	8 mice	C3H	M&F	0.1 cc. of a 0.1% olive oil solution, 1 inj.	S.C.	0[64]	6 mos. avg.	over 17 mos.
Heston and Levillain, 1953	80 mice	A	M&F	0.01 cc. on filter paper suspended in an 8-liter desiccator, vapor exposure of 15 minutes	Inhalation	tumors[65]	30 killed at 4 mos.	11 mos.

[57] Increased incidence of pulmonary adenomas. No other details.

[58] Lung adenomas in 93% of survivors; mean number per mouse 2.6. Controls had 60.7%; mean number per mouse .93.

[58a] Lung adenomas in 68.1% of survivors; mean number per mouse 1.09. Controls had 13%; average number 1.13 per mouse.

[59] 2 Sarcomas at site of injection, 5 pulmonary adenomas, 22 hepatomas.

[60] 1 Sarcoma site of injection, 13 pulmonary adenomas, 1 lymphocytic leukemia and 1 mammary tumor, (30 controls had 15 pulmonary adenomas, 2 hepatomas, 3 myoepitheliomas and 2 lymphocytic leukemias).

[61] 1 Sarcoma at site of injection, 2 pulmonary adenomas, 8 mammary tumors and 1 hepatoma (16 controls had 1 pulmonary adenoma, 2 hepatomas and 7 mammary tumors).

[62] 2 sarcomas and 1 mammary tumor at site of injection, 1 other mammary tumor and 1 pulmonary adenoma.

[63] 1 Sarcoma at site of injection, 7 hepatomas.

[64] 3 Females with mammary tumor (16 controls had 7 mammary tumors, 1 pulmonary adenoma and 2 hepatomas).

[65] Pulmonary adenomas in 33 mice (44%) as compared with 21 (27%) in untreated controls. Treated mice also had 3 lymphocytic leukemias and 1 hemangioendothelioma. Controls had only 1 hepatoma.

Reference	Animal	Strain or type	Sex	Preparation and dose	Site and route	Animals with tumors	Survival	Duration of experiment
124. --2,2'-DICHLOROISOPROPYL-N,N-DIETHYL CARBAMATE $(C_2H_5)_2N\text{-}COOCH(CH_2Cl)_2$								
Hidalgo and Whitehead, 1951	mice	white	----	----	I.P.	tumors[66]	----	----
125. --2,2'-DICHLOROISOPROPYL N-ETHYL CARBAMATE $C_2H_5NH\text{-}COOCH(CH_2Cl)_2$								
Hidalgo and Whitehead, 1951	mice	white	----	----	I.P.	tumors[66]	----	----
126. --DIETHOXYDIMETHYLSILANE $(CH_3)_2Si(OC_2H_5)_2$								
Rowe et al., 1948	rats	Wistar	F	2000 p.p.m., 7 hr. exposures, 30 hrs.	Inhalation	0	----	41 d.
127. --DIETHYL AMIDO LAURATE								
Hopper et al., 1949	10 mice	Harlan	M&F	0.96 gm. per kg. daily, 6 d. per wk.	P.O.	0	1 died	30 d.
128. --DIETHYLAMINE $(C_2H_5)_2NH$								
Brieger and Hodes, 1951	6 rabbits	----	----	50 and 100 p.p.m. 7 hrs. per d. per wk. for 6 wks.	Inhalation	0	all alive	6 wks.
129. --DIETHYLENE GLYCOL $HOCH_2CH_2OCH_2CH_2OH$								
Wegener, 1953	20 rats	Albino	M&F	1 ml. per 100 g. of a 20% aqueous solution for 12 wks., daily	P.O.	0	----	8 mos.
130. --DIETHYLENE GLYCOL DICAPRATE $O[CH_2CH_2OCO(CH_2)_8CH_3]_2$								
Mallette and von Hamm, 1952	6 rats	----	----	6 gm. per kg. minimum dosage	I.P.	0	----	1 mo.
131. --DIETHYLENE GLYCOL MONOBUTYL ETHER ACETATE $CH_3(CH_2)_3OCH_2CH_2OCH_2CH_2OCOCH_3$								
Draize et al., 1948	50 chicks	----	----	Undiluted, daily	Skin	0	----	90 d.
	100 mice	----	----	Undiluted, daily	Skin	0	----	90 d.
	90 rats	----	----	Undiluted, daily	Skin	0	----	90 d.
	150 guinea pigs	----	----	Undiluted, daily	Skin	0	----	90 d.
	100 rabbits	----	----	Undiluted, daily	Skin	0	----	90 d.
132. --N,N-DIETHYL ETHYL CARBAMATE $(C_2H_5)_2N\text{-}COOC_2H_5$								
Larsen, 1948	24 mice	A	M&F	0.5 mg. per gm. body wt. in water once weekly for 13 wks.	I.P.	86%[67]	22 alive at 16 wks.	16 wks.

[66] Adenomas of lung. Stated to be more carcinogenic than ethyl carbamate. Also induced hyperplasia of gastric mucosa.

[67] Pulmonary adenomas, mean number 4.0 (19% in the untreated controls).

Reference	Animal	Strain or type	Sex	Preparation and dose	Site and route	Animals with tumors	Survival	Duration of experiment
132.--N,N-DIETHYL ETHYL CARBAMATE $(C_2H_5)_2N\text{-}COOC_2H_5$--Continued								
Larsen, 1948	30 mice	A	M&F	0.375 mg. per gm. body wt. in tricaprylin once weekly for 13 wks.	I.P.	90%[68]	29 alive at 16 wks.	16 wks.
133.--DI-2-ETHYLHEXYL ADIPATE $(CH_2)_4[COOCH_2CH(C_2H_5)(CH_2)_3CH_3]_2$								
Mallette and von Hamm, 1952	6 rats	----	----	6 gm. per kg. minimum dosage	I.P.	0	----	1 mo.
134.--2,2-DIETHYL-1,3-PROPANEDIOL $HOCH_2C(C_2H_5)_2CH_2OH$								
Berger and Ludwig, 1950	20 rats	----	----	1% in the diet	P.O.	0	----	90 d.
135.--N,N-DIETHYLSUCCINAMIDE n-PROPYL ESTER $CH_3CH_2CH_2OOC(CH_2)_2CON(C_2H_5)_2$								
Draize et al., 1948	70 mice	----	----	Undiluted, daily	Skin	0	----	90 d.
	40 rats	----	----	Undiluted, daily	Skin	0	----	90 d.
136.--1,1-DIFLUOROETHANE CH_3CHF_2								
Lester and Greenberg, 1950	8 rats	White	----	10%, 16 hrs. exposure daily for 2 mos.	Inhalation	0	all alive	2 mos.
137.--DIISOBUTYL KETONE $(CH_3)_2CHCH_2COCH_2CH(CH_3)_2$								
Carpenter et al., 1953	20 guinea pigs	Mixed	M	250 and 125 p.p.m., exposed 7 hrs. per d., 5 d. per wk. for 6 wks.	Inhalation	0	----	6 wks.
	150 rats	Sherman	M&F	1650, 924, 533, 251 and 125 p.p.m., exposed 7 hrs. per d., 5 d. per wk. for 6 wks.	Inhalation	0	Some died	6 wks.
138.--N,N-DIISOPROPYL ETHYL CARBAMATE $[(CH_3)_2CH]_2N\text{-}COOC_2H_5$								
Larsen, 1948	51 mice	A	M&F	0.5 mg. per gm. body wt. in tricaprylin once weekly for 13 wks.	I.P.	79%[69]	48 alive at 16 wks.	16 wks.
	40 mice	A	M&F	0.5 mg. per gm. body wt. in tricaprylin once weekly for 13 wks.	I.P.	95%[70]	39 alive at 16 wks.	16 wks.
139.--DIISOPROPYL FLUOROPHOSPHATE $[(CH_3)_2CHO]_2POF$								
Frawley et al., 1952	5 rats	----	M	1 p.p.m. in the diet	P.O.	0[70a]	----	8 wks.
Barnes and Denz, 1953	4 chicks	----	----	1 mg. per kg. once weekly for 10 wks.	P.O.	0	----	10 wks.

[68] Pulmonary adenomas, mean number 2.5 (17% in the untreated controls).
[69] Pulmonary adenomas, mean number 1.6 (17% in the untreated controls).
[70] Pulmonary adenomas, mean number 2.3 (17% in the untreated controls).
[70a] No detailed pathology reported.

Reference	Animal	Strain or type	Sex	Preparation and dose	Site and route	Animals with tumors	Survival	Duration of experiment
140. --DIISOPROPYL TARTRATE $(CH_3)_2CHOCO(CHOH)_2COOCH(CH_3)_2$								
Draize et al., 1948	80 mice	----	----	Undiluted, daily	Skin	0	----	90 d.
	20 rats	----	----	Undiluted, daily	Skin	0	----	90 d.
141. --1,4-DIMETHANESULPHONOXY BUTANE $CH_3SO_2O(CH_2)_4OSO_2CH_3$								
Boyland and Sargent, 1951	16 mice	Stock	----	0.5 mg. per ml. in arachis oil, 0.05 ml. of solution in 1, 2 or 4 sites	Intradermal	0	----	at least 70 d.
	5 mice	C57	----	2.0 mg. per ml. in saline, 0.05 ml. of solution in 1, 2 or 4 sites	Intradermal	0	----	at least 40 d.
142. --1,6-DIMETHANESULPHONOXY HEXANE $CH_3SO_2O(CH_2)_6OSO_2CH_3$								
Boyland and Sargent, 1951	5 mice	Stock	----	2.0 mg. per ml. in arachis oil, 0.05 ml. of solution in 1, 2 or 4 sites	Intradermal	0	----	at least 98 d.
143. --DI-N-METHYL ETHYL CARBAMATE $(CH_3)_2N\text{-}COOC_2H_5$								
Larsen, 1947	Mice	A	----	----	Inj.	Tumors[54]	----	- ----
Larsen, 1948	54 mice	A	M&F	0.5 mg. per gm. body wt. in water once weekly for 13 wks.	I.P.	81%[71]	53 alive at 16 wks.	16 wks.
144. --DIOCTYL SEBACATE $(CH_2)_8[COOCH_2CH(C_2H_5)(CH_2)_3CH_3]_2$								
Mallette and von Hamm, 1952	6 rats	----	----	6 gm. per kg. minimum dosage	I.P.	0	----	1 mo.
145. --N,N-DI-n-PROPYL ETHYL CARBAMATE $(CH_3CH_2CH_2)_2N\text{-}COOC_2H_5$								
Larsen, 1948	40 mice	A	M&F	0.5 mg. per gm. body wt. in tricaprylin weekly for 13 wks.	I.P.	95%[70]	39 alive at 16 wks.	16 wks.
146. --N,N-DIPROPYL SUCCINAMIC ACID ETHYL ESTER $(CH_3CH_2CH_2)_2NCOCH_2CH_2COOC_2H_5$								
Draize et al., 1948	90 mice	----	----	Undiluted, daily	Skin	0	----	90 d.
	50 rats	----	----	Undiluted, daily	Skin	0	----	90 d.
147. --DODECAMETHYLPENTASILOXANE $(CH_3)_3Si\text{-}O\text{-}[Si(CH_3)_2\text{-}O]_3\text{-}Si(CH_3)_3$								
Rowe et al., 1948	Rabbits	----	----	20 applications	Skin	0	----	1 mo.
	Rats	Wistar	----	1 dose of either 0.1, 0.3, 1.0, 3.0 or 10.0 ml. per kg.	I.P.	0	----	90 d.

[54] Of the lung.
[70] Pulmonary adenomas, mean number 2.3 (17% in the untreated controls).
[71] Pulmonary adenomas, mean number 2.7 (17% in the untreated controls).

Reference	Animal	Strain or type	Sex	Preparation and dose	Site and route	Animals with tumors	Survival	Duration of experiment
148.--ETHYL ACRYLATE $CH_2=CHCOOC_2H_5$								
Pozzani et al., 1949	rats	Sherman	M&F	300 p.p.m. air, seven hr. daily exposures	Inhalation	0	18 died during the experiment	30 d.
	30 rats	Sherman	M&F	70 p.p.m. air, seven hr. daily exposures	Inhalation	0	100%	30 d.
	9 rabbits	----	M	70 p.p.m. air, seven hr. daily exposures	Inhalation	0	2 died during the experiment	30 d.
Treon et al., 1949c	1 rabbit	----	----	5 ml., 24 applications in one day	Skin	0	----	53 d.
	2 rabbits	----	----	3 or 5 ml., 3 applications daily for 2 d.	Skin	0	100%	3 mos.
	4 rabbits	----	----	74.8 p.p.m., 50 seven hr. exposures daily	Inhalation	0	100%	70 d.
	2 guinea pigs	----	----	74.8 p.p.m., 50 seven hr. exposures daily	Inhalation	0	100%	70 d.
	2 rats	----	----	74.8 p.p.m., 50 seven hr. exposures daily	Inhalation	0	100%	70 d.
	2 guinea pigs	----	----	26.2 p.p.m., 130 seven hr. exposures daily	Inhalation	0	100%	185 d.
	2 rats	----	----	26.2 p.p.m., 130 seven hr. exposures daily	Inhalation	0	100%	185 d.
	1 monkey	----	----	26.2 p.p.m., 130 seven hr. exposures daily	Inhalation	0	100%	185 d.
	4 rabbits	----	----	24.5 p.p.m., 130 seven hr. exposures daily	Inhalation	0	100%	185 d.
	2 guinea pigs	----	----	24.5 p.p.m., 130 seven hr. exposures daily	Inhalation	0	100%	185 d.
	2 rats	----	----	24.5 p.p.m., 130 seven hr. exposures daily	Inhalation	0	100%	185 d.
	1 monkey	----	----	24.5 p.p.m., 130 seven hr. exposures daily	Inhalation	0	100%	185 d.
	2 rabbits	----	----	0.0315 gm. per kg., 25 doses	P.O.	0	100%	35 d.
149.--ETHYL ALCOHOL C_2H_5OH								
Best et al., 1949	rats	----	M	15% by volume in the drinking water[22a]	P.O.	0	----	177 d.
Moro, 1949	8 rabbits	----	----	0.4 ml. of 95% alcohol, once. In 3 rabbits 2 injs. with a 2 mo. interval	Injected in the posterior chamber of the eye (1 side)	0[72]	----	175 d.
Klatskin et al., 1951	24 rats	Sprague-Dawley	----	15% aqueous as drinking water	P.O.	0	50% killed at 117 d.	180 d.
Wanscher, 1953	17 rats	Albino	----	20% in drinking water, 0.3% cystine diet	P.O.	0[73]	----	20 wks.
	11 rats	Albino	----	20% in drinking water, 0.2% cystine diet	P.O.	0[74]	----	12 wks.

[22a] Various diets used.
[72] Bone formation in the eyes.
[73] Fatty infiltration and necrosis of liver; in controls also.
[74] Fatty infiltration of liver, alcohol rats only.

Reference	Animal	Strain or type	Sex	Preparation and dose	Site and route	Animals with tumors	Survival	Duration of experiment
149.--ETHYL ALCOHOL C_2H_5OH--Continued								
Wanscher, 1953	25 rats	Albino	----	20% in drinking water, 1% cystine diet	P.O.	0[75]	----	24 wks.
	9 rats	Albino	----	20% in drinking water, 0.2% choline and 1.0% cystine in the diet	P.O.	0[75]	----	22 wks.
	5 rats	Albino	----	20% in drinking water, 1% cystine plus 0.4% choline in the diet	P.O.	0[76]	----	12 wks.
	14 rats	Albino	----	20% in drinking water, 0.5% cystine diet	P.O.	0[75]	----	10 wks.
	6 rats	Albino	----	20% in drinking water, 0.5% cystine plus 0.2% choline diet	P.O.	0[76]	----	12 wks.
	11 rats	Albino	----	20% in drinking water, 0.3% cystine diet	P.O.	0[75]	----	8 wks.
	5 rats	Albino	----	20% in drinking water, 0.3% cystine plus 0.2% choline diet	P.O.	0[76]	----	20 wks.
150.--ETHYLAMINE $C_2H_5NH_2$								
Brieger and Hodes, 1951	6 rabbits	----	----	50 and 100 p.p.m. 7 hrs. per d., 5 d. per wk. for 6 wks.	Inhalation	0	100%	6 wks.
151.--ETHYL BUTYRATE $CH_3(CH_2)_2COOC_2H_5$								
Salmon and Copeland, 1949b	7 rats	AES	----	25% in the synthetic diet for 3 to 35 wks.	P.O.	0[77]	----	35 wks.
152.--ETHYL CARBAMATE $NH_2\text{-}COOC_2H_5$								
Guyer and Claus, 1947	91 rats	----	M&F	10% aqueous soln., 1 cc. per 100 g. body wt., 1-5 inj.	I.P.	Tumors[78]	----	10 mos.
Jaffé, 1947a	57 rats	Albino	----	0.15% in diet	P.O.	Tumors[79]	----	15 mos.
	28 rats	Albino	----	30 injs. of 100 mg. within 3 mos. 1 cc. dose of a 10% aqueous solution.	I.P.	Tumors[80]	13 died by 6 mos.	15 mos.
Jaffé, 1947b	57 rats	Albino[81]	----	0.15% in the diet for up to 15 mos.	P.O.	Tumors[82]	31 died by 9 mos.	15 mos.
Jaffé, 1947d	14 mice	Albino	----	0.15% in the diet	P.O.	100%[82a]	----	4 mos.
	50 mice	Albino	----	0.75% in the diet	P.O.	98%[82a]	----	4 mos.
Larsen, 1947	Mice	A	----	----	Inj.	Tumors[54]	----	----

[54] Of the lung.
[75] Necrosis and fatty infiltration of liver, controls and treated.
[76] Liver necrosis, controls and treated.
[77] Three cases of hyperplasia of gastric mucosa.
[78] Multiple pulmonary adenomas in 66 animals.
[79] 7 Pulmonary adenomas, 1 hepatoma, 1 sarcoma, 1 endothelioma.
[80] 1 Pulmonary adenoma, 3 hepatomas.
[81] This stock has a 5% tumor incidence at 18 mos. No spontaneous pulmonary tumors have been observed.
[82] 28% developed pulmonary adenomas. (59% surviving more than 12 months had tumors). In addition 1 hepatoma, 1 sarcoma and 1 endothelioma developed. Several rats had proliferative hyperplasia of the bronchial epithelium.
[82a] Lung adenomas. 5% lung adenomas in untreated controls.

Reference	Animal	Strain or type	Sex	Preparation and dose	Site and route	Animals with tumors	Survival	Duration of experiment
152.--ETHYL CARBAMATE NH_2-$COOC_2H_5$--Continued								
Jaffé, 1948	Mice	Albino	----	0.15% in the diet	P.O.	Tumors[83]	----	110 d.
	Mice	Albino	----	0.15% in the diet, 0.4% sodium thiosulfate added to the diet	P.O.	Tumors[84]	----	110 d.
	Mice	Albino	----	0.075% in the diet	P.O.	Tumors[85]	----	110 d.
	Mice	Albino	----	0.075% in the diet, 0.4% sodium thiosulfate added to the diet	P.O.	Tumors[86]	----	110 d.
	Mice	Albino	----	0.15 mg.	S.C.	Tumors[87]	----	110 d.
	Mice	Albino	----	0.15 mg., 0.4% sodium thiosulfate added to the diet	S.C.	Tumors[88]	----	110 d.
Larsen, 1948	104 mice	A	M&F	0.5 mg. per gm. body wt. in water once weekly for 13 wks.	I.P.	100%[89]	102 alive at 16 wks.	16 wks.
Noble and Millar, 1948	7 mice	Rockland Swiss	F	25% in 5% zinc acetate	S.C.	Tumors[90]	----	----
Selbie and Thackray, 1948	30 mice	CBA	M&F	5% in distilled water, 0.2 cc. twice weekly for 5 wks.	I.P.	Tumors[91]	24 alive at 7 mos.	7 mos.
	30 mice	CBA	M&F	5% in distilled water, 0.4 cc. twice weekly	P.O.[23]	Tumors[91]	9 alive at 7 mos.	7 mos.
	30 mice	CBA	M&F	5% in distilled water, 0.05 cc. twice weekly	Nasal instillation	Tumors[91]	4 alive at 7 mos.	7 mos.
Smith and Rous, 1948	Mice[92]	C	F	0.3 cc. of a 10% saline solution, 4 or 6 inj.	S.C.	Tumors[93]	----	104 d.
Tischendorf and Fritze, 1948	Rabbits	----	----	56.4 g. by daily doses of 0.4 - 1.0 g.	----	0	----	93 d.
Cowen, 1949	11 mice	AxC57	M	0.1% in the drinking water for 3 mos.	P.O.	Tumors[94]	9 alive at 7 mos.	7 mos.
	9 mice	AxC57	M	0.1% in the drinking water for 8 wks.	P.O.	Tumors[94]	8 alive at 7 mos.	7 mos.
	17 mice	AxC57	M	0.1% in the drinking water for 8 wks. Also treated with pentose nucleotides.	P.O.	Tumors[95]	13 alive at 7 mos.	7 mos.
Mostofi and Larsen, 1949a	60 rats	Wistar	M&F	10% solution once weekly for 13 wks. (0.01 cc. per gram body wt.)	I.P.	Tumors[96]	----	15 mos.

[23] Stomach tube.
[83] Pulmonary adenomas, 51% at 75 days, 98% at 110 days.
[84] Pulmonary adenomas, 67% at 75 days, 92% at 100 days.
[85] Pulmonary adenomas, 80% at 75 days, 100% at 110 days.
[86] Pulmonary adenomas, 60% at 75 days, 68% in 100 days.
[87] Pulmonary adenomas, 68% at 75 days, 92% at 110 days.
[88] Pulmonary adenomas, 59% at 75 days, 58% at 110 days.
[89] Pulmonary adenomas, 17% in the untreated controls.
[90] Lung adenomas, also 2 lymphosarcomas and a hemangioendothelioma at 3 and 5 months.
[91] All survivors had pulmonary adenomas.
[92] Pregnant.
[93] 21 of 80 offspring had lung adenomas, latent period 17-70 days. 97 controls were tumor free.
[94] Pulmonary adenomas, 46 nodules per mouse.
[95] Pulmonary adenomas, 26 nodules per mouse.
[96] 33% Pulmonary tumors.

Reference	Animal	Strain or type	Sex	Preparation and dose	Site and route	Animals with tumors	Survival	Duration of experiment
152.--ETHYL CARBAMATE NH_2-$COOC_2H_5$--Continued								
Mostofi and Larsen, 1949a	60 rats	Wistar	M&F	10% solution weekly for 13 wks. (0.01 cc. per gm. body weight)	I.P.	20[97]	----	15 mos.
Mostofi and Larsen, 1949b	150 mice	A	M&F	0.1% in drinking water for 13 wks.	P.O.	Tumors[98]	Sacrificed at intervals	13 wks.
Sinclair, 1949	24 mice	C3H	M&F	1% in drinking water	P.O.	Tumors[99]	15 alive at 6 mos.	6 mos.
	24 mice	C3H	M&F	10% solution in saline, twice weekly for 3 wks.	S.C. or I.P.	Tumors[100]	5 alive at 5 mos.	6 mos.
Smith and Rous, 1949	80 mice	C	F	----	S.C.	Tumors[101]	----	----
Bertrand and Quivy, 1950	8 rats	----	----	0.4 g. per kg. per day	I.P.	0	----	61 d.
Cowen, 1950a	25 mice	C57 black	M&F	0.1% in water for 3 mos.	P.O.	Tumors[102]	22 alive at 7 mos.	7 mos.
	44 mice	A	M&F	0.1% in water for 3 mos.	P.O.	Tumors[103]	15 alive at 7 mos.	7 mos.
	98 mice	C57 x (AxC57)	M&F	0.1 mg. in water for 3 mos.	P.O.	Tumors[104]	82 alive at 7 mos.	7 mos.
	33 mice	A x (AxC57)	M&F	0.1% in water for 3 mos.	P.O.	Tumors[105]	15 alive at 7 mos.	7 mos.
	28 mice	AxC57 black	M&F	0.1% in water for 7 wks., 3 mos.	P.O.	Tumors[106]	23 alive at 7 mos.	7 mos.
	7 guinea pigs	----	M&F	0.1% solution, drinking water	P.O.	0	4 died	19 mos.
	7 chickens	Brown Leghorn	M	0.2% in water	P.O.	0	3 died	18 mos.
	6 chickens	Brown Leghorn	F	3 cc. - 2 cc. of 25% soln., 3 times weekly for 4 mos., 2 mo. interval, 2 times weekly for 5 mos.	I.P.	Tumors[107]	3 alive at 6 mos.	11 mos.
Cowen, 1950b	18 mice	Stock	M	20% in acetone once weekly for 1 yr.	Skin	0	11 died by 5 mos.	1 yr.
Boyland and Sargent, 1951	20 mice	Mixed	----	100 or 50 mg. per ml. in water, 0.05 ml. of soln. in 20 or 60 cites	Intradermal	0	----	at least 52 d.
Brian, 1951	20 mice	Swiss	----	1 dose of 0.15, 0.20 ml. of a 10% soln.	I.P.	Tumors[108]	16	134 d.
Kirschbaum and Shapiro, 1951	Mice[109]	Dba Bagg albino	----	6 weekly anaesthetic doses	----	Tumors[110]	----	13 mos.

[97] Pulmonary adenomas.
[98] Pulmonary, no details.
[99] All at 6 months had lung tumors. Other indeterminate lesions also reported.
[100] All at 5 months had lung tumors. Other indeterminate lesions also reported.
[101] 21 with pulmonary adenomas in offspring.
[102] Average of one tumor per mouse.
[103] Average of 79 tumors per mouse.
[104] Average of 18 tumors per mouse.
[105] Average of 56 tumors per mouse.
[106] Average of 41 tumors per mouse.
[107] In one animal. Lymphoid tumor in lungs and heart.
[108] 96% with pulmonary adenomas (controls said to have low tumor incidence, 2%, but time not stated clearly).
[109] With grafts of lung tissue in ears.
[110] In grafts and hosts. Few details in this abstract.

Reference	Animal	Strain or type	Sex	Preparation and dose	Site and route	Animals with tumors	Survival	Duration of experiment
152.--ETHYL CARBAMATE NH_2-$COOC_2H_5$--Continued								
Mostofi and Larsen, 1951a	51 mice	I	----	1.0 mg. per gm. body wt. for 13 wks.	I.P.	Tumors[121]	----	at least 13 wks.
	215 mice	C	----	1.0 mg. per gm. body wt. for 13 wks.	I.P.	Tumors[122]	----	at least 13 wks.
	73 mice	A	----	1.0 mg. per gm. body wt. for 13 wks.	I.P.	Tumors[122]	----	at least 13 wks.
	83 mice	A	F	25 mg. in one inj.	I.V.	Tumors[122]	----	6 mos.
	85 mice	A	----	25 mg. in one inj. to mothers 50 d. before delivery.	I.V.	Tumors[123]	----	6 mos.
	82 mice	A	----	25 mg. in one inj. to mothers 3 d. before delivery	I.V.	Tumors[123]	----	6 mos.
	71 mice	A	----	24 mg. in one inj. to mothers 4 d. before delivery	I.V.	Tumors[124]	----	6 mos.
	57 mice	A	----	25 mg. in one inj. to mothers 2 d. before delivery	I.V.	Tumors[125]	----	6 mos.
	73 mice	A	----	1 inj. of 25 mg. to mothers 1 d. before delivery	I.V.	Tumors[122]	----	6 mos.
	73 mice	A	----	10% in water (1.0 mg. per wk.)	I.P.	Tumors[122]	----	----
	48 mice	A	----	5% in water (0.5 mg. per wk.)	I.P.	Tumors[122]	----	----
	86 mice	A	----	0.1% in water (0.07 mg. per wk.)	P.O.	Tumors[126]	----	----
	21 mice	A	----	2% in water (1.0 mg. per wk. in 5 inj.)	I.P.	Tumors[122]	----	----
	43 mice	A	----	10% in tricaprylin (1.0 mg. per wk)	I.P.	Tumors[122]	----	----
	142 mice	C3H	----	0.1 mg. per gm. body wt. for 13 wks.	I.P.	Tumors[124]	----	----
Mostofi and Larsen, 1951b	100 mice	A	M&F	0.1% in water for 13 mos.	P.O.	Tumors[127]	6 sacrificed each wk. after first wk.	13 wks.
Rogers, 1951	30 mice	Swiss	M	1 mg. per gm. body wt.	I.P.	Tumors[128]	All sacrificed at 8 wks.	8 wks.
	30 mice[129]	Swiss	M	1 mg. per gm. body wt.	I.P.	Tumors[130]	All sacrificed at 8 wks.	8 wks.
	30 mice	A	M	1 mg. per gm. body wt., 1 inj.	I.P.	Tumors[131]	All sacrificed at 8 wks.	8 wks.

[121] 90% Pulmonary adenomas.
[122] 100% Pulmonary adenomas.
[123] 73% Pulmonary adenomas.
[124] 76% Pulmonary adenomas.
[125] 82% Pulmonary adenomas.
[126] 99% Pulmonary adenomas.
[127] Multiple adenomas of the lung in all mice sacrificed after 6 wks.
[128] 20 of 24 survivors had pulmonary adenomas.
[129] Fasted 19 hours prior to injection and 18 hours after injection.
[130] 22 of 22 survivors had pulmonary adenomas.
[131] 25 of 28 survivors with pulmonary adenomas.

Reference	Animal	Strain or type	Sex	Preparation and dose	Site and route	Animals with tumors	Survival	Duration of experiment
152.--ETHYL CARBAMATE NH_2-$COOC_2H_5$--Continued								
Rogers, 1951	50 mice	Swiss	M	1 mg. per gm. body wt.	I.P.	Tumors[122]	----	4 mos.
	27 mice	A	M	1 mg. per gm. body wt., 3 inj. at weekly intervals	I.P.	Tumors[131a]	All sacrificed at 21 wks.	21 wks.
	27 mice	A	M	1 mg. per gm. body wt., 3 inj. at weekly intervals, 7 wk. interval and 3 further inj.	I.P.	Tumors[132]	All sacrificed at 21 wks.	21 wks.
	24 mice	A	M	1 mg. per gm. body wt., 4 inj. at various intervals	I.P.	Tumors[132a]	All sacrificed at 13 wks.	13 wks.
	24 mice	A	M	1 mg. per gm. body wt., 2 inj. with a week's interval.	I.P.	Tumors[133]	All sacrificed at 13 wks.	13 wks.
	25 mice	Swiss	M	0.5 mg. per gm. body wt. as a 5% aqueous soln., 2 inj. at a 5 hr. interval	I.P.	Tumors[133a]	All sacrificed at 8 wks.	8 wks.
	25 mice	Swiss	M	0.5 mg. per gm. body wt. as a 5% aqueous soln., 2 inj. at a 24 hr. interval	I.P.	Tumors[133b]	All sacrificed at 8 wks.	8 wks.
	25 mice	Swiss	M	1 mg. per gm. body wt. as a 5% aqueous soln.	I.P.	Tumors[134]	Sacrificed at 8 wks.	8 wks.
	Mice	Swiss	M	0.25 mg. per gm. body wt. as a 5% aqueous soln., 4 inj. at 4.5 hr. intervals	I.P.	Tumors[135]	Sacrificed at 9 wks.	9 wks.
	30 mice	Swiss	M	1 mg. per gm. body wt. as a 5% aqueous solution	I.P.	Tumors[135]	Sacrificed at 9 wks.	9 wks.
	25 mice	Swiss	M	1.0 mg. per gm. body wt. as a 5% aqueous soln.	I.P.	Tumors[135a]	Sacrificed at 9 wks.	9 wks.
	25 mice	Swiss	M	0.5 mg. per gm. body wt. as a 5% aqueous soln.	I.P.	Tumors[134]	Sacrificed at 9 wks.	9 wks.
	25 mice	Swiss	M	0.25 mg. per gm. body wt. as a 5% aqueous soln.	I.P.	Tumors[136]	Sacrificed at 9 wks.	9 wks.
	25 mice	Swiss	M	1 mg. per gm. body wt. as a 5% aqueous soln.	I.P.	Tumors[137]	Sacrificed at 7 wks.	7 wks.
	25 mice	Swiss	M	1.0 mg. per gm. body wt. as a 5% aqueous soln.	I.P.	Tumors[138]	Sacrificed at 9 wks.	9 wks.
	25 mice	Swiss	M	0.5 mg. per gm. body wt. as a 5% aqueous soln.	I.P.	Tumors[139]	Sacrificed at 9 wks.	9 wks.
	25 mice	Swiss	M	0.25 mg. per gm. body wt., as a 5% aqueous soln.	I.P.	Tumors[139a]	Sacrificed at 9 wks.	9 wks.

[122] 100% Pulmonary adenomas.
[132] 15 of 16 survivors with pulmonary adenomas.
[132a] 23 of 23 survivors with pulmonary adenomas.
[133] 19 of 21 survivors with pulmonary adenomas.
[133a] 15 of 15 survivors with pulmonary adenomas.
[133b] 16 or 16 survivors with pulmonary adenomas.
[134] 15 of 16 survivors with tumors.
[135] 19 of 22 survivors with pulmonary adenomas.
[135a] 18 or 18 survivors with pulmonary adenomas.
[136] 4 of 17 survivors with pulmonary adenomas.
[137] 24 of 25 survivors with pulmonary adenomas.
[138] 18 of 20 survivors with pulmonary adenomas.
[139] 16 of 20 survivors with pulmonary adenomas.
[139a] 16 of 19 survivors with pulmonary adenomas.

Reference	Animal	Strain or type	Sex	Preparation and dose	Site and route	Animals with tumors	Survival	Duration of experiment
152.--ETHYL CARBAMATE NH_2-$COOC_2H_5$--Continued								
Rogers, 1951	25 mice	Swiss	M	1 mg. per gm. body wt. as a 5% aqueous soln.	I.P.	Tumors[140]	Sacrificed at 7 wks.	7 wks.
	25 mice	Swiss	M	1 mg. per gm. body wt. as a 5% aqueous soln.	I.P.	Tumors[141]	Sacrificed at 7 wks.	7 wks.
	25 mice	Swiss	M	1 mg. per gm. body wt. as a 5% aqueous soln.	I.P.	Tumors[142]	Sacrificed at 7 wks.	7 wks.
	25 mice	Swiss	M	1 mg. per gm. body wt. as a 5% aqueous soln.	I.P.	Tumors[143]	Sacrificed at 7 wks.	7 wks.
Shapiro and Kirschbaum, 1951	28 mice	FA	----	1 mg. per gm. body wt. in 10% aqueous soln., once weekly for 6 wks.	I.P.	0	----	9 mos.
	25 mice	FB	----	1 mg. per gm. body wt. in 10% aqueous soln., once weekly for 6 wks.	I.P.	3[144]	----	9 mos.
	55 mice	dba	----	1 mg. per gm. body wt. in 10% aqueous soln., once weekly for 6 wks.	I.P.	9[145]	----	9 mos.
	23 mice	NA	----	1 mg. per gm. body wt., in 10% aqueous soln., once weekly for 6 wks.	I.P.	23[146]	----	9 mos.
	25 mice	CBA	----	1 mg. per gm. body wt. in 10% aqueous soln., once weekly for 6 wks.	I.P.	24[147]	----	9 mos.
	33 mice	Baggxdba F_1	----	1 mg. per gm. body wt. in a 10% aqueous soln., once weekly for 6 wks.	I.P.	33[148]	----	9 mos.
	25 mice	Strong A	----	1 mg. per gm. body wt. in 10% aqueous soln., once weekly for 6 wks.	I.P.	23[149]	----	9 mos.
	25 mice	Bagg Albino	----	1 mg. per gm. body wt. in 10% aqueous soln., once weekly for 6 wks.	I.P.	25[150]	----	9 mos.
Balo et al., 1952	42 mice	White	----	0.2 cc. of a 10% soln., 2 times weekly for 7 wks., interval of 3 wks. then 2 more wks. of treatment (total of 19 inj. per animal)	I.P.	Tumors[151]	----	6 mos.
	100 mice	White	----	0.0015 gm. in 1 cc. of milk for 17 d., daily	P.O.	1[155a]	----	10 mos.
	224 mice	White	----	----	----	0	----	----
Bertrand and Quivy, 1952	7 rats[152]	----	F	Parents treated with 0.4 mg. per gm. for 3 wks. until delivery	I.P.	0	----	At least 76 d.
	8 rats	----	F	0.4 mg. per gm., daily for 35 d.	I.P.	0	----	79 d.
	4 rats	----	F	0.4 mg. per gm., daily for 39 d.	I.P.	0	----	81 d.

[140] 19 with pulmonary adenomas.
[141] 21 with pulmonary adenomas.
[142] 22 with pulmonary adenomas.
[143] 23 with pulmonary adenomas.
[144] Pulmonary adenomas. Average of 1 nodule per mouse.
[145] Pulmonary adenomas. Average of 2 nodules per mouse.
[146] Pulmonary adenomas. Average of 7 nodules per mouse.
[147] Pulmonary adenomas. Average of 4 nodules per mouse.
[148] Pulmonary adenomas. Average of 8 nodules per mouse.
[149] Pulmonary adenomas. Average of 15 nodules per mouse.
[150] Pulmonary adenomas. Average of 10 nodules per mouse.
[151] 18 tumors in 42 mice. First tumor appeared at 76 days.
[152] Offspring. Generation study.
[155a] Pulmonary adenoma.

Reference	Animal	Strain or type	Sex	Preparation and dose	Site and route	Animals with tumors	Survival	Duration of experiment
152.--ETHYL CARBAMATE NH_2-$COOC_2H_5$--Continued								
Bertrand and Quivy, 1952	4 rats	----	M	0.4 mg. per gm. daily for 21 d.	I.P.	0	----	81 d.
	2 rats	----	M	0.4 mg. per gm. daily for 37 d.	I.P.	0[153]	----	67 d.
	2 rats	----	M	0.4 mg. per gm. daily for 35 d.	I.P.	0[154]	----	53 d.
	9 rats[152]	----	M	Parents treated with 0.4 mg. per gm. for 3 wks. until delivery	I.P.	0	----	At least 76 d.
Burdette, 1952	Mice	WxA F1 hybrids	----	----	----	Tumors[154a]	----	----
Funagoshi, 1952	110 rabbits	----	----	0.1 - 3.0 gm. per kg. once or repeatedly	S.C. or I.V.	0	----	60 d.
Klein, 1952a	22 mice[111]	A[112]	F	0.25 cc. of a 10% aqueous soln.	I.P.	Tumors[113]	19 mothers and 69 offspring alive at 6 mos.	at least 353 d.
	23 mice[114]	A[112]	F	0.25 cc. of a 10% aqueous soln.	I.P.	Tumors[115]	20 mothers 83 offspring alive at 6 mos.	at least 328 d.
	6 mice[114]	A[112]	F	0.25 cc. of a 10% aqueous soln.	I.P.	Tumors[116]	5 mothers 17 offspring alive at 6 mos.	at least 323 d.
	35 mice[117]	A[112]	F	0.25 cc. of a 10% aqueous soln.	I.P.	Tumors[118]	30 mothers, 97 offspring alive at 6 mos.	at least 358 d.
	33 mice[119]	A[112]	F	0.25 cc. of a 10% aqueous soln.	I.P.	Tumors[120]	140 offspring alive at 6 mos.	at least 180 d.
Mirick et al., 1952	Mice	Swiss & A	----	0.1% in drinking water for 7 wks.	P.O.	Tumors[155]	----	5 mos.

[111] Pregnant mice injected on the 17th day.
[112] Originally with agouti gene.
[113] Pulmonary adenomas, 56.5% with an average of 0.9 nodules in offspring's lungs and 94.7% with an average of 9.5 nodules in mothers' lungs. Controls had 7.9% tumors.
[114] Pregnant mice injected on the 18th day.
[115] Pulmonary adenomas, 83.1% with an average of 2.7 nodules in offspring's lungs and 90% with an average of 7.0 nodules in mother's lungs. Control had 7.9% tumors.
[116] Pulmonary adenomas, 76.5% with average of 3.7 nodules in offspring's lungs and 100% with an average of 12.6 nodules in mothers' lungs. Controls had 7.9% tumor.
[117] Pregnant mice injected on 19th day.
[118] Pulmonary adenomas, 95.5% with an average of 9.4 nodules in offspring's lungs and 100% with an average of 9.2 nodules in mothers' lungs. Controls had 7.9% tumors.
[119] Mothers sacrificed 1 and 5 hours following injection. Offspring delivered by caesarean section.
[120] In offspring delivered 1 hour after injection 100% with an average of 19.9 long nodules, in offspring delivered 5 hours after injection 97.1% with an average of 16.4 lung nodules.
[152] Offspring. Generation study.
[153] Hyperplasia of "reticulated elements".
[154] "Myeloid reaction".
[154a] Pulmonary adenomas, no details.
[155] 93.8% in Swiss and 100% in A with pulmonary adenomas at 6 months of age.

Reference	Animal	Strain or type	Sex	Preparation and dose	Site and route	Animals with tumors	Survival	Duration of experiment
152. --ETHYL CARBAMATE NH_2-$COOC_2H_5$--Continued								
Balo et al., 1953	42 mice	----	----	0.2 cc. of a 10% soln. twice weekly for 7 wks., interval of 3 wks. then again treated for 2 wks. (total of 19 inj. per animal or 0.38 gm.)	I.P.	Tumors[155b]	----	6 mos.
	100 mice	----	----	0.0015 gm. in 1 cc. of milk, daily for 70 d.	P.O.	1[155a]	Sacrificed at 10 mos.	10 mos.
Glover and Jennings, 1953	36 mice	CBA	M&F	1.0% in water twice weekly for 12 wks.	I.P.	Tumors[156]	3 died	256 d.
	50 mice	Albino	M&F	1% in water twice weekly for 12 wks.	I.P.	Tumors[157]	4 died	251 d.
	5 mice	Albino	M	0.125% in drinking water	P.O.	0	----	43 d.
	36 mice	CBA	M&F	1% in water twice weekly for 12 wks.[158]	P.O.	21[159]	14 died	256 d.
	36 mice	CBA	M&F	1% in water twice weekly for 12 wks.	P.O.	20[159]	13 died	256 d.
	5 mice	CBA	M	0.125% in drinking water	P.O.	0	----	63 d.
Gross et al., 1953	24 mice[159a]	Ak	----	10% aqueous soln. in distilled water, 14 inj.	I.P.	17[159b]	----	9 mos.
	16 mice	Bagg albino	----	10% aqueous soln. in distilled water, 16 inj.	I.P.	16[159b]	----	9 mos.
	36 mice	Swiss albino	----	10% aqueous soln. in distilled water, 16 inj.	I.P.	36[159b]	----	9 mos.
	47 mice	C57 black	----	10% aqueous soln, in distilled water, 16 inj.	I.P.	33[159b]	----	9 mos.
	79 mice	White footed field mice	----	10% aqueous soln. in distilled water, 16 inj.	I.P.	0	----	16 mos.
	199 mice	C3H	----	10% aqueous soln. in distilled water, 16 inj.	I.P.	189[159b]	----	9 mos.
Malmgren and Saxen, 1953	55 mice	A	M&F	1 mg. per gm. body wt.	I.P.	Tumors[160]	----	6 mos.
	38 mice	A	M&F	1 mg. per gm. body wt., 1 inj. plus transplant of lung	I.P.	Tumors[161]	----	6 mos.
Salaman and Roe, 1953	26 mice	Stock albino 'S'	M	24 mg. in acetone, 2 applications, followed by 0.5% croton oil in acetone weekly for 18 wks.	Skin	115 pap.[162]	22 alive at 22 wks.	23 wks.
	24 mice	Stock albino "S"	M	24 mg. in acetone, 2 applications.	Skin	0	19 alive at 19 wks.	19 wks.
	20 mice	Stock albino "S"	M	60 mg. in acetone weekly for 18 wks.	Skin	0	17 alive at 18 wks.	18 wks.

[155] 93.8% in Swiss and 100% in A with pulmonary adenomas at 6 months of age.
[155a] Pulmonary adenoma.
[155b] 18 animals with pulmonary adenomas. First adenoma appeared on the 76th day.
[156] Lung adenomas after 190 days. (No numbers)
[157] Lung adenomas after 113 days. (No numbers)
[158] Plus grey-lung virus.
[159] Lung adenomas.
[159a] 7 mice died from spontaneous leukemia before termination of the experiment.
[159b] Pulmonary tumors.
[160] Host untreated, 17 pulmonary adenomas. 52 grafts of lung from urethane treated mice; 11 pulmonary adenomas. 53 grafts of lungs from normal mice; 1 pulmonary adenoma.
[161] 58 hosts had pulmonary tumors. 54 grafts of tissue from previously urethane treated mice; 22 pulmonary adenomas. 56 grafts of tissue from normal mice; 1 pulmonary adenoma.
[162] Total number of tumors.

Reference	Animal	Strain or type	Sex	Preparation and dose	Site and route	Animals with tumors	Survival	Duration of experiment
152.--ETHYL CARBAMATE NH_2-$COOC_2H_5$--Continued								
Salaman and Roe, 1953	20 mice	Stock albino "S"	M	60 mg. in acetone weekly for 18 wks. Also 0.5% croton oil in acetone weekly for 18 wks.	Skin	138 pap., 1 epi.[163]	17 alive at 18 wks.	18 wks.
	12 mice	Stock albino "S"	F	Acetone soln. 120 to 360 mg., 2 application. Followed by 0.5% croton oil in acetone weekly for 20 wks.	Skin	13 pap.,[164]	8 alive at 16 wks.	33 wks.
Klein (unpublished data)	30 mice	A/JAX	M	0.1% aqueous, 3 times weekly	I.P.	29[165]	15 alive at 1 yr.	1 yr.
153.--N,N'-ETHYLENE-BIS (ETHYL CARBAMATE) $(-CH_2NHCOOCH_2CH_3)_2$								
Larsen, 1948	49 mice	A	M&F	0.5 mg. per gm. body wt., suspension in tricaprylin once weekly for 13 wks.	I.P.	98%[166]	45 alive at 16 wks.	16 wks.
154.--ETHYLENE CHLOROHYDRIN CH_2ClCH_2OH								
Ambrose, 1950b	5 rats	----	M	0.32% in the diet	P.O.	0	All died at 49 d.	49 d.
	5 rats	----	M	0.12% in the diet	P.O.	0	----	403 d.
	30 rats	----	M	0.01 - 0.24% in the diet	P.O.	0	----	220 d.
155.--ETHYLENE DIBROMIDE $BrCH_2CH_2Br$								
Rowe et al., 1952b	40 rats	----	M&F	50 p.p.m. air, up to 63 seven hr. exposures daily	Inhalation	0	26 alive at 91 d.	91 d.
	16 guinea pigs	----	M&F	50 p.p.m. air, up to 57 seven hr. exposures daily	Inhalation	0	----	80 d.
	rabbits	----	M&F	50 p.p.m. air, 59 seven hr. exposures daily	Inhalation	0	4 alive at 84 d.	84 d.
	2 monkeys	----	M&F	50 p.p.m. air, 49 seven hr. exposures daily	Inhalation	0	----	70 d.
	40 rats	----	M&F	25 p.p.m. air, 151 seven hr. exposures daily	Inhalation	0	26 alive at 213 d.	213 d.
	16 guinea pigs	----	M&F	25 p.p.m. air, 145 seven hr. exposures daily	Inhalation	0	10 alive at 205 d.	205 d.
	rabbits	----	M&F	25 p.p.m. air, 152 seven hr. exposures daily	Inhalation	0	4 alive at 214 d.	214 d.
	2 monkeys	----	M&F	25 p.p.m. air, 156 seven hr. exposures daily	Inhalation	0	----	220 d.

[163] Total number of tumors. The epithelioma had a metastasis.
[164] Total number of tumors at 16 weeks, 11 in 5 survivors at 20 weeks. Also 4 with lung adenomas.
[165] Pulmonary adenomas. Average tumor multiplicity 6.0.
[166] Pulmonary adenomas, mean number 8.2 (17% in untreated controls).

Reference	Animal	Strain or type	Sex	Preparation and dose	Site and route	Animals with tumors	Survival	Duration or experiment
156. --ETHYLENE DICHLORIDE CH_2ClCH_2Cl								
Spencer et al., 1951	15 rats	Wistar	M	400 p.p.m., 7 hr. exposures up to 40 times	Inhalation	0	----	56 d.
	8 guinea pigs	----	F	400 p.p.m., 7 hr. exposures up to 24 times	Inhalation	0	----	32 d.
	2 monkeys	Rhesus	M	100 p.p.m., 148, 7 hr. exposures	Inhalation	0	----	212 d.
	3 rabbits	----	M&F	100 p.p.m., 178 seven hr. exposures	Inhalation	0	----	248 d.
	8 guniea pigs	----	F	100 p.p.m., 162 seven hr. exposures	Inhalation	0	----	226 d.
	8 guniea pigs	----	M	100 p.p.m., 121 seven hr. exposures	Inhalation	0	----	170 d.
	15 rats	Wistar	F	100 p.p.m., 142 seven hr. exposures	Inhalation	0	----	198 d.
	15 rats	Wistar	M	100 p.p.m., 115 seven hr. exposures	Inhalation	0	----	211 d.
	16 guinea pigs	----	M&F	200 p.p.m., 180 seven hr. exposures	Inhalation	0	----	246 d.
	30 rats	Wistar	M&F	200 p.p.m., 157 seven hr. exposures	Inhalation	0	----	212 d.
	rabbits	----	M&F	400 p.p.m., 165 seven hr. exposures	Inhalation	0	3 survived	232 d.
157. --2-ETHYL HEXANEDIOL-1, 3 $CH_3CH_2CH_2CHOHCH(C_2H_5)CH_2OH$								
Draize et al., 1948	90 rats	----	----	Undiluted, daily	Skin	0	----	90 d.
	150 mice	----	----	Undiluted, daily	Skin	0	----	90 d.
	40 chicks	----	----	Undiluted, daily	Skin	0	----	90 d.
	40 guinea pigs	----	----	Undiluted, daily	Skin	0	----	90 d.
158. --2-ETHYLHEXYL AZELATE $(CH_2)_7[COOCH_2CH(C_2H_5)(CH_2)_3CH_3]_2$								
Mallette and von Hamm, 1952	6 rats	----	----	6 gm. per kg. minimum dosage	I.P.	0	----	1 mo.
159. --N, N'-ETHYLIDENE-BIS (ETHYL CARBAMATE) $CH_3CH(NHCOOC_2H_5)_2$								
Larsen, 1948	50 mice	A	M&F	0.5 mg. per gm. body wt. suspension in tricaprylin once weekly for 13 weeks	I.P.	100%[168]	48 alive at 16 wks.	16 wks.
160. --FERRIC CITRATE $HO\text{-}C(COO)(CH_2COO)_2Fe\cdot xH_2O$								
Kaufman et al., 1952	5 rats	Albino	M	2.2% in the diet, 3 - 4 mos.	P.O.	0	----	4 mos.

[168] Pulmonary adenomas, mean number 45.5 (17% in the untreated controls.)

Reference	Animal	Strain or type	Sex	Preparation and dose	Site and route	Animals with tumors	Survival	Duration of experiment
161. --FERRIC DIMETHYLDITHIOCARBAMATE $[(CH_3)_2N\text{-}CS\text{-}S]_3\ Fe$								
Hodge et al., 1952a	dogs	----	----	5 or 25 mg. per kg. by capsule daily for 1 mo.	P.O.	0	100%	1 mo.
	40 rats	Rochester	M&F	0.01 - 0.5% in the diet for 1 mo.	P.O.	0	----	1 mo.
162. --FLUOROETHYL CARBAMATE $H_2N\text{-}COOCH_2CH_2F$								
Klein, M. (unpub. data)	8 mice	A/JAX	M	0.1% aqueous, 3 times weekly	I.P.	5[169]	4 alive at 9 mos.	1 yr.
	16 mice	A/JAX	M	0.1% aqueous, 3 times weekly	I.P.	3[170]	12 alive at 11 mos.	1 yr.
163. --FORMALDEHYDE HCHO								
Boyland and Sargent, 1951	19 mice	C57	----	2.0 mg. per ml. in water, 0.05 ml. of solution in 76 sites	Intradermal	0	----	At least 63 d.
Parkes and Wrigley, 1951	6 rats	Wistar	----	0.1 ml. of a 2% solution, 5 d. per wk.	S.C.	0	----	32 d.
164. --GALLIUM CITRATE $HO\text{-}C(COO)(CH_2COO)_2\ Ga$								
Dudley, et al., 1950	20 rats	----	----	1000 p.p.m. in the diet (1 gm. per kg.)	P.O.	0[170a]	1 died during experiment	13 wks.
	10 rabbits	----	----	20 - 50 mg. Ga. per kg., one dose	I.V.	0[170a]	7 alive at 60 d.	60 d.
	10 dogs	----	----	20 - 50 mg. Ga. per kg.	I.V.	0[170a]	7 alive at 60 d.	60 d.
Dudley and Marrar, 1952	Rabbits	----	----	30 mg. per kg. Ga.	I.V.	0[170a]	----	12 mos.
	Rats	Albino	M	30 mg. per kg. Ga.	S.C.	0[170a]	----	12 mos.
165. --GALLIUM LACTATE $(CH_3CHOHCOO)_3\ Ga$								
Dudley and Levine, 1949	40 rats	----	M&F	500 or 1000 p.p.m. in the diet	P.O.	0	39 alive at 26 wks.	26 wks.
	25 rabbits	----	----	5 mg. per cc. in distilled water plus sodium lactate plus sodium bicarbonate (15 - 40 mg. per kg. in one inj.)	I.V.	0	25 alive at 30 d.	At least 30 d.
	130 rats	----	----	25 - 150 mg. per kg. as a 5% aqueous solution plus sodium lactate plus sodium bicarbonate	S.C.	0	----	60 d.
	35 rats	----	----	5 mg. per cc. in distilled water plus sodium lactate plus sodium bicarbonate (28 - 50 mg. per kg. total dose in one inj.)	I.V.	0	----	At least 30 d.

[169] Pulmonary adenomas, average tumor multiplicity 0.6.
[170] Pulmonary adenomas, average tumor multiplicity 0.3.
[170a] No detailed pathology reported.

Reference	Animal	Strain or type	Sex	Preparation and dose	Site and route	Animals with tumors	Survival	Duration of experiment
165.--GALLIUM LACTATE $(CH_3CHOHCOO)_3$ Ga--Continued								
Dudley and Levine, 1949	30 rabbits	----	----	70 - 110 mg. per kg. as 5% aqueous solution plus sodium lactate and sodium bicarbonate	S.C.	0	----	60 d.
166.--GLYCEROL $CH_2OHCHOHCH_2OH$								
Anderson et al., 1950	5 rats	----	F	5% in water. Naturally occurring glycerol	P.O.	0	----	6 mos.
	5 rats	----	----	5% in water. Synthetic glycerol, 99.8% purity	P.O.	0	1 died	6 mos.
Kopf et al, 1950	30 rats	White	M	1 ml. per 100 g. (50% aqueous) twice a week	P.O.[23]	0	----	26 wks.
	30 rats	White	M	0.5 ml. per 100 g. (50% aqueous) twice a week	P.O.[23]	0	----	26 wks.
	1 dog	----	F	2.0 ml. per kg. (50% aqueous) twice weekly	P.O.[23]	0	----	5 mos.
	2 dogs	----	M	2 ml. per kg. (50% aqueous) twice weekly	P.O.[23]	0	----	5 mos.
Kopf et al., 1951	24 rats	Albino	F	1 ml. per 100 g. (50% aqueous) twice weekly	P.O.[23]	0	----	152 d.
	15 rats	Albino	M	1 ml. per 100 g. (50% aqueous) twice weekly	P.O.[23]	0	----	152 d.
Hine et al., 1953b	24 rabbits	Albino	F	0.5 - 4.0 ml. per kg., daily applications, 5 d. per wk., 90 applications	Skin	0	1 died	18 wks.
	131 rats	Long-Evans	M&F	5, 10 or 20% of the diet (natural or synthetic)	P.O.	0[171]	44 killed at 1 yr.	105 wks.
Wegener, 1953	20 rats	Albino	M&F	1 ml. per 100 g. of 20% aqueous soln. daily for 12 wks.	P.O.	0	----	8 mos.
167.--GLYCOCYAMINE $H_2N\text{-}C(=NH)\text{-}NH\text{-}CH_2COOH$								
Buckley et al., 1951	50 rats	Sherman	F	2% in the diet. Choline deficient diet.	P.O.	0	47 alive at 5 mos.	6 mos.
	50 rats	Sherman	F	2% in the diet. 2% choline chloride supplement.	P.O.	0	45 alive at 5 mos.	6 mos.
168.--HEXAMETHYLDISILOXANE $(CH_3)_3Si\text{-}O\text{-}Si(CH_3)_3$								
Rowe et al., 1948	Rats	Wistar	----	1 dose of 0.1, 10.0 ml. per kg.	I.P.	0	----	90 d.
	Rabbits	----	----	20 applications	Skin	0	----	1 mo.

[23] Stomach tube.
[171] Malignant tumors in 11 experimental rats, benign tumors in 12 experimental rats. Considered spontaneous since 5 of 26 controls developed malignancies.

Reference	Animal	Strain or type	Sex	Preparation and dose	Site and route	Animals with tumors	Survival	Duration of experiment
169.--HEXAMETHYLENEDIAMINE $H_2N(CH_2)_6NH_2$								
Ceresa and De Blasiis, 1950	6 guinea pigs	----	----	0.02 g. daily	P.O.	0	1 alive at 70 d.	95 d.
	3 guinea pigs	----	----	0.1 g. daily	S.C.	0	3 alive	60 d.
170.--HEXAMETHYLENE-1,6-BIS-TRIMETHYLAMMONIUM IODIDE $(CH_3)_3\overset{I}{N}(CH_2)_6\overset{I}{N}(CH_3)_3$								
Paton and Zaimis, 1949	3 rabbits	----	----	10 mg. per kg., 6 days per wk. for 1 mo.	I.V.	0	----	4 mos.
171.--β-HYDROXYBUTYRIC ACID, SODIUM SALT $CH_3CHOHCH_2COONa$								
Nath et al., 1950	10 rabbits	----	----	50 mg. per kg. increasing by 7.5 mg. per wk.	I.M.	0	2 killed at 53 d.	53 d.
172.--2-HYDROXYPROPYL-TRIMETHYLAMMONIUM BROMIDE ACETATE $(CH_3)_3\overset{Br}{N}\text{-}CH_2CH(OCOCH_3)CH_3$								
Wener et al., 1948	Dogs	----	----	10 - 90 mg. doses in beeswax, 50 - 73 doses	S.C.	0	----	74 d.
	13 dogs	----	----	10 - 50 mg., 26 - 134 inj. in aqueous soln.	S.C.	0	----	194 d.
	5 dogs	----	----	10 - 90 mg. daily dose, beeswax and mineral oil mixture (total doses 37 - 71 mg.)	S.C.	0	----	74 d.
	13 dogs	----	----	10 - 40 mg. daily aqueous solution (total dose 26 - 134 mg.)	S.C.	0	----	194 d.
173.--ISOPROPANOL $(CH_3)_2CHOH$								
Weil et al., 1952	30 mice	C3H	M	0.025 ml. per inj., 20 inj.	S.C.	0[172]	27	5 mos.
	40 mice	ABC	M	0.025 ml. per inj., 20 inj.	S.C.	0[173]	49	5 mos.
	50 mice	C57 black	M	0.025 ml. per inj., 38 inj.	S.C.	0[174]	10	9 mos.
	36 mice	C3H	M	0.025 ml. per inj., 20 inj.	S.C.	1[175]	22	5 mos.
	60 mice	C57 black	M	3000 p.p.m., 167 exposures	Inhalation	5[176]	47	12 mos.
	60 mice	ABC	M	3000 p.p.m., 62 exposures	Inhalation	0[177]	41	5 mos.
	60 mice	C3H	M	3000 p.p.m., 62 exposures	Inhalation	0[178]	36	5 mos.
Weil et al., (unpub. data)	30 mice	R.A.P.	M	3 times weekly	Skin	0	----	1 yr.

[172] 3 of 40 surviving no treatment C3H controls had lung tumors.
[173] 14 lung tumors. 25 of 59 surviving no treatment ABC controls had lung tumors.
[174] 5 of 45 surviving no treatment C57 controls had lung tumor.
[175] Lung tumors. None of 33 surviving no treatment C3H controls had lung tumor.
[176] Lung tumors. 2 of 52 surviving air exposed C57 controls had lung tumors.
[177] 10 lung tumors. 25 of 77 surviving air exposed ABC controls had lung tumors.
[178] 2 lung tumors. 2 of 69 surviving air exposed C3H controls had lung tumors.

Reference	Animal	Strain or type	Sex	Preparation and dose	Site and route	Animals with tumors	Survival	Duration of experiment
174. --ISOPROPYL CARBAMATE $H_2N\text{-}COOCH(CH_3)_2$								
Larsen, 1947	Mice	A	----	----	Inj.	Tumors[54]	----	----
175. --ISOPROPYL CITRATE[178a] $HO\text{-}C(COOR)(CH_2COOR)_2$ R=H, $CH(CH_3)_2$								
Deuel, Jr., et al., 1951	80 rats	----	M&F	0.64, 1.3, 2.7 and 5.3% in the diet	P.O.	0	----	6 wks.
	60 rats	----	M&F	0.11, 0.21 and 1.1% in the diet	P.O.	0[179]	35 alive at 104 wks.	2 yrs.
	Dogs	Cocker and mongrel	----	0.06% in the diet	P.O.	0	----	12 wks.
	6 rabbits	----	----	2.2, 4, 4 and 9.2%	P.O.[23]	0	----	6 wks.
	26 rabbits	----	----	1.9, 3.8, 7.5, 15.0, 11.3 and 22.5% in the diet	P.O.	0	1 died	6 wks.
176. --N-ISOPROPYL ETHYL CARBAMATE $(CH_3)_2CH\text{-}NH\text{-}COOC_2H_5$								
Larsen, 1947	Mice	A	----	----	Inj.	Tumors[54]	----	----
Larsen, 1948	41 mice	A	M&F	0.5 mg. per gm. body wt. in tricaprylin once weekly for 13 wks.	I.P.	100%[180]	35 alive in 16 wks.	16 wks.
177. --LACTIC ACID $CH_3CHOHCOOH$								
Fazekas, 1953	Rabbits	----	F	0.1 - 0.2 gm. per kg. body wt. dissolved in 100 - 150 cc. of water, twice daily for 5 mos.	P.O.	0[1]	----	5 mos.
	5 rabbits	----	F	0.1 - 0.7 gm. per kg. dissolved in 50 - 100 cc. water, twice daily for 16 mos (13 mos. actual treatment)	P.O.	0[1]	----	16 mos.
178. --MALATHION[181] $(CH_3O)_2\overset{S}{\overset{\|}{P}}\text{-}S\text{-}\underset{\underset{CH_2\text{-}COOC_2H_5}{\|}}{CH}\text{-}COOC_2H_5$								
Hazleton and Holland, 1953	Rats	----	M&F	100, 1000 and 5000 p.p.m. in the diet, as 65, 90 or 99% technical product	P.O.	0[170a]	Mortality at various diet levels	2 yrs.
	Rats	----	----	5 p.p.m. 7 hrs. per d., 5 d. per wk. for 6 wks.	Inhalation	0	----	6 wks.

[1] Pathology report "elsewhere".
[23] Stomach tube.
[54] Of the lung.
[170a] No detailed pathology reported.
[178a] Mixture of mono-, di-, and tri-isopropyl citrates.
[179] Tumor formation noted; same in control.
[180] Pulmonary adenomas, mean number 26.6 (17% in the untreated controls).
[181] O, O-dimethyldithiophosphate of diethyl mercaptosuccinate.

Reference	Animal	Strain or type	Sex	Preparation and dose	Site and route	Animals with tumors	Survival	Duration of experiment
178.--MALATHION[181]--Continued $(CH_3O)_2P(S)-S-CH(CH_2-COOC_2H_5)-COOC_2H_5$								
Hazleton and Holland, 1953	Guinea pigs	----	----	5 p.p.m. 7 hrs. per d., 5 d. per wk. for 6 wks.	Inhalation	0	----	6 wks.
	Dogs	----	----	5 p.p.m. 7 hrs. per d., 5 d. per wk., for 6 wks.	Inhalation	0	----	6 wks.
179.--MERALLURIDE[181a] $CH_3OCH_2CH(HgOH)CH_2NHCONHCOCH_2CH_2COOH$								
Handley et al., 1951	10 dogs	----	----	Equivalent of 4 mg. Hg./kg., 3 times weekly	I.V.	0	----	4 mos.
Blumberg et al., 1952	8 rabbits	New Zealand Albino	----	10 or 5 mg. Hg./kg., twice weekly	I.M.	0	1 died	2 mos.
180.--METHOXYETHYL OLEATE $CH_3(CH_2)_7CH=CH(CH_2)_7COOCH_2CH_2OCH_3$								
Smith, 1953	40 rats	Sprague-Dawley	M	0.01 - 1.25% in the diet	P.O.	0	6 died at 1 wk.	1 yr.
181.--METHYLACETYL RICINOLEATE $CH_3(CH_2)_5CH(OCOCH_3)CH_2CH=CH(CH_2)_7COOCH_3$								
Mallette and von Hamm, 1952	6 rats	----	----	6 gm. per kg. minimum dosage	I.P.	0	----	1 mo.
182.--METHYL ACRYLATE $CH_2=CHCOOCH_3$								
Treon et al., 1949c	1 rabbit	----	----	1 ml., 6 applications daily for 2 d.	Skin	0	----	2 mos.
	1 rabbit	----	----	5 ml., 16 application in one d.	Skin	0	----	8 wks.
	2 rabbits	----	----	0.023 gm. per kg., 24 doses	P.O.	0	100%	33 d.
	4 rabbits	----	----	31.0 p.p.m., 130, 7 hr. exposures daily	Inhalation	0	100%	185 d.
	2 guinea pigs	----	----	31.0 p.p.m., 130, 7 hr. exposures daily	Inhalation	0	100%	185 d.
	Rats	----	----	31.0 p.p.m., 130, 7 hr. exposures daily	Inhalation	0	100%	185 d.
	1 monkey	----	----	31.0 p.p.m., 130, 7 hr. exposures daily	Inhalation	0	100%	185 d.
	4 rabbits	----	----	95.1 p.p.m., 50, 7 hr. exposures daily	Inhalation	0	100%	70 d.
	2 guinea pigs	----	----	95.1 p.p.m., 50, 7 hr. exposures daily	Inhalation	0	100%	70 d.
	2 rats	----	----	95.1 p.p.m., 50, 7 hr. exposures daily	Inhalation	0	100%	70 d.

[181] O, O-dimethyldithiophosphate of diethyl mercaptosuccinate.

[181a] 1-(2'-Hydroxymercuri-3'-methoxypropyl)-3-succinylurea and theophylline.

Reference	Animal	Strain or type	Sex	Preparation and dose	Site and route	Animals with tumors	Survival	Duration of experiment
183.--METHYLAMINO-ISO-OCTENE HYDROCHLORIDE $CH_3CH(NHCH_3)CH_2CH_2CH=C(CH_3)_2 \cdot HCl$								
Walton et al., 1948	3 dogs	----	----	4 mg. per kg.	I.M.	0	----	217 d.
	3 roosters	----	M	20 mg. per kg.	I.M.	0	----	132 d.
184.--METHYLAMINO-ISO-OCTENE MUCATE $2CH_3CH(NHCH_3)CH_2CH_2CH=C(CH_3)_2 \cdot HOOC(CHOH)_4COOH$								
Walton et al., 1948	3 dogs	----	----	60 mg. per kg. capsules daily (total dose 6.7 - 13.2 gm. per kg.)	P.O.	0	----	316 d.
	15 mice	Swiss	----	0.025% in aqueous solution (total 7.2 gm. per kg.)	P.O.	0	----	180 d.
	20 mice	C3H	M	0.025% in aqueous soln. (total 7.8 gm. per kg.)	P.O.	0	----	195 d.
185.--METHYL BIS(β-CHLOROETHYL)AMINE $CH_3N(CH_2CH_2Cl)_2$								
Graeff et al., 1948	Mice	----	----	35 mg. per kg. (LD_{50}), one dose	S.C.	0	----	5 mos.
Heston, 1950b	32 mice	A	M&F	0.001 mg. in 0.01 cc. distilled water per gm. body wt. at 2 d. intervals. 4 inj. (total dose per mouse 0.1 mg.)	I.V.	Tumors[184]	7 died	10 mos.
	35 mice	A	M&F	0.004 mg. in 0.2 cc. distilled water per gm. body wt. (total dose per mouse 0.1 mg.)	I.V.	Tumors[185]	----	10 mos.
Boyland and Sargent, 1951	9 mice	Stock	----	0.02 or 0.002 mg. per ml. in water, 0.05 ml. of soln. in 1, 2 or 4 sites	Intradermal	0	----	at least 54 d.
	24 mice	ABC	----	0.2 mg. per ml. in water, 0.05 ml. of soln. in 1, 2 or 4 sites	Intradermal	0	----	at least 60 d.
	5 mice	CBA	----	0.2 mg. per ml. in water, 0.05 ml. of soln. in 1, 2 or 4 sites	Intradermal	0	----	at least 50 d.
	15 mice	B	----	0.1 mg. per ml. in saline, 0.05 ml. of soln. in 1, 2 or 4 sites (Plus hyaluronidase)	Intradermal	0	----	----
	34 mice	B	----	0.2 - 0.0002 mg. per ml. in saline, 0.05 ml. of soln. in 1, 2 or 4 sites	Intradermal	0	----	at least 47 d.
Goldeck and Hageneh, 1951	44 rats	----	----	0.5 - 2.0 mg. per kg. body wt. dissolved in saline soln., once	I.V.[186]	0	----	at least 122 d.
Griffin et al., 1951a	Mice	Swiss	----	One inj., or repeated weekly inj., 1 - 40 wks.	I.V., S.C., I.P.	Tumors[198]	----	1 yr.
	Rats	Albino	----	One inj., or repeated weekly injs. 1 - 40 wks.	I.V., S.C., I.P.	0[198a]	----	1 yr.

[184] 100% pulmonary tumors in 20 mice killed at 10 months with an average of 9.6 nodules per mouse. Controls 62.5% with tumors; 0.8 nodules per mouse.

[185] 100% pulmonary adenomas in 9 survivors, 7.56 nodules per mouse. Untreated controls 58.1% with pulmonary adenomas; 0.94 nodules per mouse.

[186] Injected into femoral vein.

[198] Adenocarcinoma of lungs, leukemia, angioma, angiosarcoma and osteogenic sarcoma.

[198a] Pathological findings not discussed.

Reference	Animal	Strain or type	Sex	Preparation and dose	Site and route	Animals with tumors	Survival	Duration of experiment
186.--METHYL BIS(β-CHLOROETHYL)AMINE HYDROCHLORIDE $CH_3N(CH_2CH_2Cl)_2 \cdot HCl$								
Heston, 1949	37 mice	A	M&F	0.001 mg. in 0.01 cc. distilled water per gm. body wt. at 2 d. intervals, 4, 3 or 2 inj.	I.V.	37[187]	23 sacrificed at 16 wks.	At least 16 wks.
Jacobson et al., 1949	1 rabbit	----	----	3 mg. per kg. body wt. in saline	I.V.	0	----	35 d.
Griffin et al., 1950	Mice	Swiss	----	0.5 mg. per kg. body wt. in saline, once or weekly for 5 to 9 mos.	I.V., I.P., S.C.	Tumors[188]	----	9 mos.
	Rats	Albino	----	0.5 mg. per kg. body wt. in saline, once or weekly for 5 to 9 mos.	I.V., I.P., S.C.	Tumors[188]	----	9 mos.
Heston, 1950a	Mice	A	----	0.001 mg. in 0.01 cc. water per gm. body wt., 2, 3 and 4 inj.	S.C.	Tumors[190]	----	----
Caskey et al., 1951	28 rats	Wistar	M&F	0.3 - 0.4 mg. per kg., 4 to 5 doses in 4 - 5 d. Also given nephrotoxic sera.	I.V.	0	Large number died	2 mo.
Heston, 1953	15 mice	C3H	M&F	0.25 mg. in 0.25 cc. water, 8 inj.	S.C.	Tumors[191]	----	At least 17 mo.
	37 mice	C3Hf	M	0.25 mg. in 0.25 cc. water, 6 inj.	S.C.	Tumors[192]	----	At least 23 mo.
	21 mice	C3H	M	0.025 mg. in 0.25 cc. water, 6 inj.	S.C.	Tumors[193]	----	At least 18.5 mos.
Heston and Lorenz, 1953	Mice	A	M&F	0.025 mg. twice, 2 d. interval	I.V.	Tumors[194]	----	11 mo.
Heston et al., 1953b	59 mice	A	M&F	0.025 mg. in 0.25 cc. distilled water twice	I.V.	55[195]	9% died following treatment.	11 mos.
Salaman and Roe, 1953	16 mice	Stock albino "S"	F	0.06 to 1.2 mg. in acetone, 2 applications followed by 0.5% croton oil in acetone weekly for 20 wks.	Skin	6 pap.[195a]	14 alive at 20 wks.	33 wks.
Sugar and Kellner, 1953	26 rats	----	----	75 to 100 μg. per 100 g. body wt. every 3 d., 0.08% soln. in saline	I.P.	0	Killed between 7-155 d.	155 d.
187.--N,N-METHYLENE-BIS (ETHYL CARBAMATE) $CH_2(NHCOOC_2H_5)_2$								
Larsen, 1948	43 mice	A	M&F	0.5 mg. per gm. body wt., suspension in tricaprylin once weekly for 13 wks.	I.P.	100%[196]	37 alive at 16 wks.	16 wks.

[187] Pulmonary adenomas.
[188] 15-20% with fibrosarcoma, lymphosarcoma, and adenocarcinoma. No details.
[190] Increased incidence of pulmonary adenomas.
[191] 2 papillomas and 1 epithelioma at site of injection, 5 pulmonary adenomas, 7 mammary tumors; 14 controls had 3 pulmonary adenomas and 7 mammary tumors.
[192] 2 sarcomas and 1 papilloma at site of injection, 17 hepatomas, 21 pulmonary adenomas, 1 reticulum cell sarcoma, 1 lymphocytic leukemia and 1 hemangioendothelioma in the liver. 39 controls had 6 pulmonary adenomas, 18 hepatomas, 2 lymphocytic leukemias and 1 squamous cell carcinoma of the skin.
[193] 5 sarcomas and 1 hemangioendothelioma at site of injection, 8 pulmonary adenomas, 2 hemangioendotheliomas in the liver and 9 hepatomas. 30 controls had 5 pulmonary adenomas and 9 hepatomas.
[194] 93% pulmonary adenomas with an average of 5.1 nodules per mouse.
[195] Pulmonary adenomas. 2 "Hodgkin's-like" lesions. 25 of 64 controls with pulmonary adenomas.
[195a] At 20 weeks.
[196] Pulmonary adenomas, mean number 28.6 (17% in the untreated controls).

Reference	Animal	Strain or type	Sex	Preparation and dose	Site and route	Animals with tumors	Survival	Duration of experiment
188.--N-METHYL ETHYL CARBAMATE CH_3-NH-$COOC_2H_5$								
Larsen, 1947	Mice	A	----	----	Inj.	Tumors[54]	----	----
Larsen, 1948	35 mice	A	M&F	0.5 mg. per gm. body wt. in water once weekly for 13 wks.	I.P.	Tumors[197]	34 alive at 16 wks.	16 wks.
189.--METHYL IODIDE CH_3I								
Buckell, 1950	Mice	White	M	0.5 mg. per liter, 20 exposures (total 125 hrs.)	Inhalation	0	100%	30 d.
	Rats	----	----	100 - 500 mg. per kg. in arachis oil daily	P.O.	0	----	71 d
190.--METHYL ISOBUTYL CARBINOL AZELATE $(CH_2)_7[COOCH(CH_3)CH_2CH(CH_3)_2]_2$								
Mallette and von Hamm, 1952	6 rats	----	----	6 gm. per kg. minimum dosage	I.P.	0	----	1 mo.
191.--METHYL METHACRYLATE POLYMER[196a] $\left[-CH_2-\overset{CH_3}{\overset{\vert}{C}}(COOCH_3)-CH_2-\overset{CH_3}{\overset{\vert}{C}}(COOCH_3)-\right]_x$								
LeVeen and Barberio, 1949	Dogs	----	----	Finely divided particles	I.P. and other sites	0	----	6 mos.
192.--METHYLPOLYSILOXANE[197a] $[-Si(CH_3)_2-O-]_x$								
Child et al., 1951	6 dogs	Mongrel	----	0.3 - 3.0 gm. per kg. of the diet.	P.O.	0	100%	6 mos.
193.--2-NITRO-2-METHYL-1, 3-PROPANEDIOL O_2N-$C(CH_2OH)_2CH_3$								
Draize et al., 1948	80 rats	----	----	Undiluted, daily	Skin	0	----	90 d.
	100 mice	----	----	Undiluted, daily	Skin	0	----	90 d.
194.--2-NITROPROPANE $(CH_3)_2CHNO_2$								
Treon and Dutra, 1952	Monkey	----	----	83 p.p.m. Air, 130 seven hr. exposures	Inhalation	0	1 alive at 191 d.	191 d.
	Guinea pigs	----	----	83 p.p.m. air, 130 seven hr. exposures	Inhalation	0	2 alive at 191 d.	191 d.
	Rabbits	----	----	83 p.p.m. air, 130 seven hr. exposures	Inhalation	0	4 alive at 191 d.	191 d.

[54] Of the lung.
[196a] Lucite.
[197] Pulmonary adenomas, mean number 6.9 (17% in the untreated controls).
[197a] DC Antifoam A.

Reference	Animal	Strain or type	Sex	Preparation and dose	Site and route	Animals with tumors	Survival	Duration of experiment
194.--2-NITROPROPANE $(CH_3)_2CHNO_2$--Continued								
Treon and Dutra, 1952	Rats	----	----	83 p.p.m. air, 130 seven hr. exposures	Inhalation	0	1 alive at 191 d.	191 d.
	Cats	----	----	83 p.p.m. air, 130 seven hr. exposures	Inhalation	0	2 alive at 191 d.	191 d.
	Guinea pigs	----	----	317 p.p.m. air, 130 seven hr. exposures	Inhalation	0	2 alive at 199 d.	199 d.
	Rabbits	----	----	317 p.p.m. air, 130 seven hr. exposures	Inhalation	0	1 alive at 199 d.	199 d.
	Rats	----	----	317 p.p.m. air, 130 seven hr. exposures	Inhalation	0	2 at 199 d.	199 d.
195.--OCTADECENE NITRILE $CH_3(CH_2)_7CH=CH(CH_2)_7CN$								
Mallette and von Hamm, 1952	6 rats	----	----	6 gm. per kg. minimum dosage	I.P.	0	----	1 mos.
196.--N-(9-OCTADECENOYL)-N-METHYL TAURATE, SODIUM SALT $CH_3(CH_2)_7CH=CH(CH_2)_7CON(CH_3)CH_2CH_2SO_3Na$								
Hopper et al., 1949	10 mice	Harlan	M&F	0.663 gm. per kg. daily, 6 d. per wk.	P.O.	0	5 died	30 d.
197.--OCTAMETHYL PYROPHOSPHORAMIDE $[(CH_3)_2N]_2PO\text{-}O\text{-}PO[N(CH_3)_2]_2$								
DuBois et al., 1950	36 rats	Sprague-Dawley	M&F	0.5 or 0.25 mg. per kg. in propylene glycol, daily injections	I.P.	0	100%	60 d.
Frawley et al., 1952	5 rats	----	M	5 p.p.m. in the diet	P.O.	0[170a]	----	8 wks.
Rider et al., 1952	5 rats	Sprague-Dawley and Magman	M	0.1% aqueous soln., (various doses 0.25 - 1 mg. per day, over 97 d.)	S.C.	0	2 died at 96 d.	97 d.
	Rats	Sprague-Dawley and Magman	M	0.1% aqueous soln., 0.5 mg. per d. for 56 d., 1 mg. per d. for 26 d., 2 mg. per d. for 2 d.	S.C.	0	All survived until 83 d.	84 d.
198.--OLEYL-POLYOXYETHYLENE GLYCOL ETHER $CH_3(CH_2)_7CH=CH(CH_2)_8OCH_2O(CH_2CH_2O)_{18}CH_2CH_2OH$								
Sweeney and Oster, 1953	36 rats	----	M&F	0.1 - 0.5% in water	P.O.	0	100%	6 mos.
199.--1, 5-PENTANEDIOL DIPROPIONATE $(CH_2)_5(OCOCH_2CH_3)_2$								
Draize et al., 1948	60 mice	----	----	Undiluted, daily	Skin	0	----	90 d.
	80 rats	----	----	Undiluted, daily	Skin	0	----	90 d.

[170a] No detailed pathology reported.

Reference	Animal	Strain or type	Sex	Preparation and dose	Site and route	Animals with tumors	Survival	Duration of experiment
200.--PENTASOL AZELATE $(CH_2)_7(COOC_5H_{11})_2$								
Mallette and von Hamm, 1952	6 rats	----	----	6 gm. per kg. minimum dosage	I.P.	0	----	1 mo.
201.--POLYETHYLENE $(-CH_2-CH_2-)_x$								
Oppenheimer et al., 1952	28 mice[199]	Albino Paris	----	0.002 mm. thick film[203a]	S.C.	3 sarc.[200]	1 alive at 19 mos.	Over 19 mos.
	98 rats	Wistar	----	0.002 mm. thick film[203b]	S.C.	Tumors[201]	80 alive at 392 d.	----
	40 rats[199]	Wistar	----	0.002 mm. thick film[203a]	S.C.	5 sarc.[202]	15 alive at 20 mos.	Over 20 mos.
Druckrey and Schmahl, 1954b	23 rats	BD 1 and Wistar	----	2 pieces of film-discs	I.P. and S.C.	9[203]	15 alive at 1 yr.	26 mo.
202.--POLYETHYLENE GLYCOL $HOCH_2(CH_2OCH_2)_xCH_2OH$								
Smyth et al., 1950	64 rats	Wistar	M&F	2.0 - 0.02% in water[204]	P.O.	0	----	2 yrs.
	Rats	Sherman	----	16% soln.[204]	P.O.	0	----	90 d.
	64 rats	Wistar	M&F	0.08 - 0.00125% in water[204a]	P.O.	0	----	2 yrs.
	Rats	Sherman	----	16% soln.[204a]	P.O.	0	----	90 d.
	Rabbits	----	----	20 gm. per kg. per d., 5 d. per wk. for 5 wk.[204a]	P.O.[23]	0	100%	5 wks.
Kobernick et al., 1952	30 rats	Piebald	M	3 times weekly; applied to exteriorized gastric mucosa	----	0	----	1 yr.
203.--POLYOXYETHYLENE MONOLAURATE[205] $CH_3(CH_2)_{10}COOCH_2CH_2O-(CH_2CH_2O-)_xCH_2CH_2OH$								
Harris et al., 1951a	13 rats	Sprague-Dawley	M	25% of diet	P.O.	0	11 alive	59 d.
	30 rats	Sprague-Dawley	M&F	25% of diet	P.O.	0	25 alive	10 wks.
	30 rats	Sprague-Dawley	M&F	25% of diet	P.O.	0	22 alive	10 wks.
Harris et al., 1951b	36 hamsters	----	M&F	5% in the diet	P.O.	0	23 died	68 d.
204.--POLYOXYETHYLENE MONOSTEARATE[206] $CH_3(CH_2)_{16}COOCH_2CH_2O-(CH_2CH_2O-)_xCH_2CH_2OH$								
Harris et al., 1951a	13 rats	Sprague-Dawley	M	25% of diet	P.O.	0	13 alive	59 d.

[23] Stomach tube.
[199] At time of first tumor.
[200] Transplanted.
[201] 10 sarcomas, 8 fibrosarcomas, 1 rhabdomyosarcoma, 1 osteogenic sarcoma. First tumor at 392 days.
[202] Transplanted to 3rd. generation.
[203] Sarcoma at the site of application after 12-26 months. Etiology considered certain.
[203a] Specially manufactured pure product.
[203b] Commercial product.
[204] Carbowax 1500; average mol. wt. 1500-1600.
[204a] Carbowax 4000; average mol. wt. 3000-3700.
[205] G-2129 (commercial mixture).
[206] Myrj 45.

Reference	Animal	Strain or type	Sex	Preparation and dose	Site and route	Animals with tumors	Survival	Duration of experiment
204.--POLYOXYETHYLENE MONOSTEARATE[206]--Continued $CH_3(CH_2)_{16}COOCH_2CH_2O-(CH_2CH_2O-)_xCH_2CH_2OH$								
Harris et al., 1951a	30 rats	Sprague-Dawley	M&F	25% of diet	P.O.	0	30 alive	10 wks.
205.--POTASSIUM ACID SACCHARATE $HOOC-(CHOH)_4-COOK$								
Ambrose, 1951c	30 rats	Albino	M	0.01 - 2.0% in the diet	P.O.	0	100%	210 d.
206.--POTASSIUM ACID TARTRATE $HOOC-CHOH-CHOH-COOK$								
Ambrose, 1951c	5 rats	Albino	M	1.52% in the diet	P.O.	0	100%	210 d.
207.--PROPYL CARBAMATE $H_2N-COOCH_2CH_2CH_3$								
Larsen, 1947	Mice	A	----	----	Inj.	Tumors[54]	----	----
208.--PROPYLENE DICHLORIDE $CH_3CHClCH_2Cl$								
Heppel et al., 1948	80 mice	C3H	----	400 p.p.m., up to 37 four or seven hr. exposures	Inhalation	0[208]	3 alive	7 mos.
	5 dogs	----	F	400 p.p.m., 134 seven hr. exposures	Inhalation	0	5 alive	Over 20 wks.
	32 guinea pigs	----	M&F	400 p.p.m., 134 seven hr. exposures	Inhalation	0	7 died	At least 1 yr.
	49 rats	----	M&F	400 p.p.m., 140 seven hr. exposures	Inhalation	0	3 died	At least 1 yr.
209.--PROPYLENEGLYCOL DIPROPIONATE $CH_3CH(OCOCH_2CH_3)CH_2OCOCH_2CH_3$								
Ambrose, 1951a	5 rats	----	----	1.28% in the diet	P.O.	0	----	401 d.
	30 rats	----	----	0.04 - 2.56% in the diet	P.O.	0	----	232 d.
210.--N-n-PROPYL ETHYL CARBAMATE $CH_3CH_2CH_2NH-COOC_2H_5$								
Larsen, 1948	54 mice	A	M&F	0.5 mg. per gm. body wt. in tricaprylin once weekly for 13 wks.	I.P.	100%[209]	37 alive at 16 wks.	16 wks.
211.--PUTRESCINE $H_2N(CH_2)_4NH_2$								
Danneberg, (unpub. data)	15 rats	White	----	5 mg. daily (total dose 3 g.), orally	P.O.	0	10 alive at 1 yr.	33 mos.
212.--SODIUM DIETHYLDITHIOCARBAMATE $(C_2H_5)_2N-CS-SNa$								
Ambrus et al., 1951	15 mice	----	----	50 mg. per kg. daily for 6 wks.	S.C.	0[210]	----	6 wks.

[54] Of the lung.
[206] Myrj 45.
[208] Hepatomas in 3 mice, probably spontaneous.
[209] Pulmonary adenomas, mean number 3.7 (17% in the untreated controls).
[210] Colloid free goiters of thyroid glands.

Reference	Animal	Strain or type	Sex	Preparation and dose	Site and route	Animals with tumors	Survival	Duration of experiment
213. --SODIUM LAURYL SULFATE $CH_3(CH_2)_{11}OSO_3Na$								
Fitzhugh and Nelson, 1948b	36 rats	Osborne-Mendel	M	0.25 - 1.0% in the diet	P.O.	0	33 alive at 1 yr.	2 yrs.
	15 rats	Osborne-Mendel	M	2 - 8% in the diet	P.O.	0	At least 5 died in 2 wks.	16 wks.
214. --SODIUM SULFOETHYL METHYL OLEAMIDE $CH_3(CH_2)_7CH=CH(CH_2)_7CONHCH_2CH_2SO_3Na$								
Fitzhugh and Nelson, 1948b	25 rats	Osborne-Mendel	M	0.5 - 8% in the diet	P.O.	0	----	16 wks.
215. --STEARYL CITRATE[213] $HO-C(COOR)(CH_2COOR)_2$ R=H, $CH_3(CH_2)_{17}$-								
Deuel, Jr., et al., 1951	16 rabbits	----	M&F	2 and 10% in the diet	P.O.	0	----	6 wks.
	80 rats	----	M&F	1.3, 2.5, 5.0 and 10.0% in the diet	P.O.	0	----	6 wks.
	59 rats	----	M&F	0.5, 2.0 and 10.0% in the diet	P.O.	0[214]	36 alive at 104 wks.	2 yrs.
	Dogs	Cocker and Mongrel	----	3.0% in the diet	P.O.	0	----	12 wks.
216. --SULFATED BUTYL OLEATE $CH_3(CH_2)_7CH(OSO_3H)(CH_2)_8COOC_4H_9$ [213a]								
Hopper et al., 1949	10 mice	Harlan	M&F	0.87 gm. per kg. daily, 6 d. per wk.	P.O	0	7 died	30 d.
217. --SULPHOCHOLINE CHLORIDE $(CH_3)_2\overset{Cl}{\overset{|}{S}}(CH_2CH_2OH)$								
Maw and du Vigneaud, 1948	2 rats	Rockland	M	0.2% in the diet	P.O.	0	----	32 d.
218. --TAURINE $NH_2CH_2CH_2SO_3H$								
Handler and Follis, 1948	8 rats	Vanderbilt	M	1.0% in the diet. Choline deficient	P.O.	0	1 died	120 d.
219. --TEFLON $(-CF_2-CF_2-)_x$								
LeVeen and Barberio, 1949	Dogs	----	----	Finely divided particles	I.P. and other sites	0	----	6 mos.

[213] Mixture of mono-, di-, and tri- stearyl citrates.
[213a] Nopco 2272-R.
[214] Tumor formation noted; same in controls.

Reference	Animal	Strain or type	Sex	Preparation and dose	Site and route	Animals with tumors	Survival	Duration of experiment
220.--1, 1, 2, 2,-TETRABROMOETHANE $CHBr_2CHBr_2$								
Gray, 1950	36 rats	Albino	----	Saturated atmosphere, 15 minutes daily (total 14.5 hrs.)	Inhalation	0	100%	92 d.
	6 rabbits	----	----	Saturated atmosphere, 15 minutes daily (total 7.25 hrs.)	Inhalation	0	100%	47 d.
	12 guinea pigs	----	----	Saturated atmosphere, 15 minutes daily (total 15 hrs.)	Inhalation	0	1 died	92 d.
	48 mice	Albino	----	Saturated atmosphere, 15 minutes daily (total 13 hrs.)	Inhalation	0	1 died	92 d.
221.--TETRACHLOROETHYLENE $CCl_2=CCl_2$								
Wenzel and Gibson, 1951	15 rats	Wistar	M	0.33 mg. per kg., 8 doses with 4 d. intervals	P.O.	0	----	32 d.
Rowe et al., 1952a	2 rabbits	Albino	M	2500 p.p.m., 28 seven hr. exposures	Inhalation	0	----	39 d.
	8 guinea pigs	----	M&F	2500 p.p.m., 18 seven hr. exposures	Inhalation	0	----	44 d.
	30 rats	Wistar	M&F	400 p.p.m., 130 seven hr. exposures	Inhalation	0	30 alive at 183 d.	183 d.
	16 guinea pigs	----	M&F	400 p.p.m., up to 169 seven hr. exposures	Inhalation	0	16 alive at 236 d.	236 d.
	4 rabbits	Albino	M&F	400 p.p.m., 159 seven hr. exposures	Inhalation	0	----	222 d.
	2 monkeys	Rhesus	M	400 p.p.m., 170 seven hr. exposures	Inhalation	0	----	250 d.
	16 guinea pigs	----	M&F	200 p.p.m., 158 seven hr. exposures	Inhalation	0[216]	----	220 d.
	11 guinea pigs	----	M&F	100 p.p.m., 132 seven hr. exposures	Inhalation	0	----	185 d.
222.--1, 1, 2,2-TETRACHLORO-1, 2-DIFLUOROETHANE $CFCl_2CFCl_2$								
Greenberg and Lester, 1950	Rats	White	----	2 gm. per kg. per d. for 23 to 33 d.	P.O.[23]	0	----	33 d.
223.--1, 1, 1,2-TETRACHLORO-2, 2-DIFLUOROETHANE CCl_3CClF_2								
Greenberg and Lester, 1950	Rats	White	----	2 gm. per kg. per d. for 23 to 33 d.	P.O.[23]	0	----	33 d.
224.--TETRAETHYLAMMONIUM CHLORIDE $(C_2H_5)_4NCl$								
Gruhzit et al., 1948	Dogs	----	----	7.5 - 15.0 mg. per kg. 2 times daily, 65 - 170 doses in distilled water	I.M.	0	----	115 d.
Keith, Jr., et al., 1952	5 dogs	----	----	Weekly or biweekly inj., total dose 65 - 85	I.V.	0[215a]	----	At least 5.5 wks. to at least 10 wks.

[23] Stomach tube.
[215a] No pathology studied.
[216] Fatty degeneration of liver, but no cirrhosis.
[216b] Only the teeth studied.

Reference	Animal	Strain or type	Sex	Preparation and dose	Site and route	Animals with tumors	Survival	Duration of experiment
225.--TETRAETHYL ORTHOSILICATE $Si(OC_2H_5)_4$								
Rowe et al., 1948	Rats	Wistar	M	125 p.p.m. for 7 hrs., 30 times	Inhalation	0	----	42 d.
Pozzani and Carpenter, 1951	30 rats	Sherman	M&F	500 p.p.m., 7 hrs. per d., 5 d. per wk. for 42 d.	Inhalation	0	11 died	42 d.
	12 guinea pigs	----	M	125, 62.5 and 31 p.p.m., 7 hrs. per d., 5 d. per wk.	Inhalation	0	----	90 d.
	30 rats	Sherman	M&F	125, 62.5 and 31 p.p.m., 7 hrs. per d., 5 d. per wk.	Inhalation	0	----	90 d.
	23 mice	Albino	F	125, 62.5 and 31 p.p.m., 7 hrs. per d., 5 d. per wk.	Inhalation	0	----	90 d.
226.--TETRAETHYLTHIURAM DISULFIDE $(C_2H_5)_2N\text{-}CS\text{-}S\text{-}S\text{-}CS\text{-}N(C_2H_5)_2$								
Brieger and Hodes, 1949	Rabbits	----	----	0.0019 mg. per liter air 7 hrs. per d. per wk. for 5 wks.	Inhalation	0	----	5 wks.
Aaes-Jorgensen et al., 1951	8 rats	----	F	0.025% in the diet	P.O.	0	6 alive	10 wks.
Child and Crump, 1952	2 dogs	Mongrel	----	0.1 gm. per kg. daily	P.O.	0	100%	30 d.
	2 dogs	Mongrel	----	0.1 gm. per kg. daily	P.O.	0	----	360 d.
	10 rats	Wistar	----	1.5 gm. per kg. once, 50% aqueous suspension	S.C.	0	100%	6 mos.
	10 rats	Wistar	----	4 gm. per kg. once, 50% aqueous suspension	S.C.	0	100%	6 mos.
Pindborg, 1952	10 rats	Wistar	----	0.025% of the diet for 4 mos.	P.O.	0[216b]	----	4 mos.
227.--TETRAMETHYLTHIOUREA $(CH_3)_2N\text{-}CS\text{-}N(CH_3)_2$								
Schindler et al., 1948	5 rats	----	M	5 mg. per d. in the diet	P.O.	0	----	30 d.
	5 rats	----	M	50 mg. per d. in the diet	P.O.	0	----	30 d.
228.--TETRAMETHYLTHIURAM DISULFIDE $(CH_3)_2N\text{-}CS\text{-}S\text{-}S\text{-}CS\text{-}N(CH_3)_2$								
Brieger and Hodes, 1948	Rabbits	----	----	0.0019 mg. per liter air 7 hrs. daily, 5 d. per wk. for 5 wks.	Inhalation	0	----	5 wks.
	Rabbits	----	----	0.00127 mg. per liter air 24 hrs. per day for 33 d.	Inhalation	0	----	33 d.
229.--THIOACETAMIDE CH_3CSNH_2								
Fitzhugh and Nelson, 1948a	50 rats	----	----	0.005 - 0.1% in the diet	P.O.	Tumors[216a]	10 rats died in 1 mo. at 0.1%	2 yrs.

[216a] 1 hepatoma at 0.05% and 1 at lower concentration. Considered attributable to treatment. No spontaneous hepatomas seen.

[216b] Only the teeth studied.

Reference	Animal	Strain or type	Sex	Preparation and dose	Site and route	Animals with tumors	Survival	Duration of experiment
229. --THIOACETAMIDE--Continued CH_3CSNH_2								
Ambrose et al., 1949	40 rats	----	----	0.001 - 0.128% in the diet	P.O.	0[217]	----	190 d.
Ambrose et al., 1950	20 rats	----	M&F	0.032% in the diet for 78 days; various dietary supplements	P.O.	0[218]	----	78 d.
	13 rats	----	M&F	0.032% in the diet for 30, 60 or 120 d.	P.O.	0	----	120 d.
	5 rats	----	M&F	0.032% in the diet for 120 d.	P.O.	0	----	290 d.
230. --2, 2'-THIODIETHANOL DIACETATE $S(CH_2CH_2OCOCH_3)_2$								
Draize et al., 1948	40 mice	----	----	Undiluted, daily	Skin	0	----	90 d.
	50 rats	----	----	Undiluted, daily	Skin	0	----	90 d.
231. --1-THIOGLYCEROL $CH_2OH-CHOH-CH_2SH$								
Kensler and Elsner, 1949	9 rabbits	----	----	7.5% aqueous soln., 6 d. weekly	Skin	0[219]	----	2 mos.
	6 rats	----	----	0.3% in the diet	P.O.	0	----	34 d.
232. --1-THIOGLYCOL CH_2OH-CH_2SH								
Kensler and Elsner, 1949	12 rats	Wistar and Sherman	----	200 - 300 mg. per kg. (9.7% aqueous soln.)	I.P.	0[219]	----	92 d.
233. --THIOGLYCOLIC ACID $CH_2SH-COOH$								
Kensler and Elsner, 1949	6 rats	----	----	0.3% in the diet	P.O.	0	----	34 d.
234. --THIOUREA $CS(NH_2)_2$								
Gorbman, 1947	156 mice	A, C57, I, and crosses	----	2% in diet	P.O.	Tumors[220]	----	566 d.
Dalton et al., 1948	21 mice	C3H	F	0.25% in the diet for 13 wks. followed by 0.375% up for to 42 wks.	P.O.	0[221]	Killed at various intervals	42 wks.
Fitzhugh et al., 1948a	126 rats	Albino	----	1 - 0.001% in the diet	P.O.	Tumors[222]	----	2 yrs.
Fitzhugh and Nelson, 1948a	126 rats	Albino	----	1 - 0.01% in the diet	P.O.	Tumors[223]	29 alive at 2 yrs.	2 yrs.

[217] Cirrhosis of the liver, bile duct hyperplasia with "adenoma-like" nodules on higher doses.
[218] Atrophy of the thyroids.
[219] Mild thyroid hyperplasia.
[220] Adenomas of the thyroid.
[221] Hyperplastic thyroid changes and "thyroid tissue nodules" in lungs.
[222] At all levels below 0.25%, hepatomas. Dosages of 0.25, 0.05 and 0.1% produced hyperplasia of the thyroid.
[223] 14 hepatomas, also many with thyroid enlargement. Tumor mostly in higher dosage groups.

Reference	Animal	Strain or type	Sex	Preparation and dose	Site and route	Animals with tumors	Survival	Duration of experiment
234. --THIOUREA--Continued $CS(NH_2)_2$								
Malcolm et al., 1949	14 rats	Wistar sub-strain	M&F	0.25% in water	P.O.	0[224]	----	107 wks.
Kensler and Elsner, 1949	5 rats	----	----	0.1% in the diet	P.O.	0	----	34 d.
Vazquez-Lopez, 1949	51 mice	R3	F	0.1 - 0.5% in water for 1 yr.	P.O.	0[225]	----	621 d.
	49 mice	C3H	F	0.1 - 0.5% in water for 6 mos.	P.O.	0[226]	----	757 D.
	85 mice	C3H	F	0.1 - 0.5% in water	P.O.	0[227]	----	757 d.
Wilson and DeEds, 1950	Rats	----	F	0.05 - 0.15% in the diet; various diets.	P.O.	0[228]	----	300 d.
Haley et al., 1951	20 rats	CFW	M	0.1% in water	P.O.	0	9 alive at 30 d.	39 d.
Casas and Koppisch, 1952	37 mice	C3H	M&F, castr.	0.3% in the diet changed to 0.2%	P.O.	Tumor[229]	6 died in 1st 2 wks.	7 mos.
	12 mice	C3H	----	0.3% in the diet changed to 0.2%	P.O.	0[230]	----	7 mos.
Janes and Bradbury, 1952	28 rats	Long Evans	F	0.5% in water for 8 mos.	P.O.	0[231]	----	At least 8 mos.
Weil et al., (unpub. data)	30 mice	CFW	M	0.01 gm. of 10% aqueous soln. per inj., 20 inj.	S.C.	0[232]	26 alive	5 mos.
	30 mice	ABC	M	0.01 gm. of 10% aqueous soln. per inj., 20 inj.	S.C.	0[233]	25 alive	5 mos.
235. --TRIBUTYRIN $C_3H_5(CH_3CH_2CH_2COO)_3$								
Salmon and Copeland, 1949b	Rats	AES	----	25% in a synthetic diet for 3 to 35 wks.	P.O.	Tumors[234]	Several died early	35 wks.
	Rats	AES	----	15% in a synthetic diet for 3 to 35 wks.	P.O.	Tumors[234]	Several died early	35 wks.
Salmon and Copeland, 1949a	100 rats	AES	----	15 - 25% in the diet, 3 to 37 wks.	P.O.	Tumors[235]	----	37 wks.
236. --TRICAPRYLIN $C_3H_5[CH_3(CH_2)_6COO]_3$								
Steiner and Falk, 1951	304 mice	C57 black	M&F	0.2 to 2.0 cc.	S.C.	3 sarc.	280 alive at 4 mos.	22 mos.
Steiner and Edgecomb, 1952	40 mice	C57 black	M&F	0.5 cc.	S.C.	0	27 alive at 9 mos.	28 mos.

[224] Thyroid and parathyroid hyperplasia, ostentis fibrosa.
[225] Thyroid hyperplasia, lymphomas, mammary tumors. (Similar to control incidence).
[226] Mammary tumor incidence lower than controls. No thyroid changes.
[227] Mammary tumor incidence lower than controls; other tumors (lymphoma) as in controls.
[228] No full report, changes seen in thyroid, adrenal and liver.
[229] 1 adenoma of the thyroid at 7 months, no details. Other thyroids hyperplastic.
[230] Thyroid hyperplasia.
[231] 2 ovarian cysts.
[232] Lung adenomas. 8 of 28 surviving no treatment CFW controls had lung tumors.
[233] Lung adenomas. 6 or 29 surviving no treatment ABC controls had lung tumors.
[234] Papillomatosis of the gastric mucosa in the forestomach in all rats autopsied.
[235] Papillomas of the forestomach and hyperplastic and hyperkeratotic lesions of stomach.

Reference	Animal	Strain or type	Sex	Preparation and dose	Site and route	Animals with tumors	Survival	Duration of experiment
237 --TRICHLOROACETONITRILE CCl_3CN								
Treon et al., 1949b	2 monkeys	----	----	0.84 or 5.3 p.p.m. air, 130 seven hr. exposures	Inhalation	0	100%	26 wks.
	4 cats	----	----	0.84 or 5.3 p.p.m. air, 130 seven hr. exposures	Inhalation	0	100%	26 wks.
	5 guinea pigs	----	----	0.84, 5.3 or 13.5 p.p.m. air, 50 or 130 seven hr. exposures	Inhalation	0	100%	26 wks.
	9 rabbits	----	----	0.84, 5.3 or 13.5 p.p.m. air, 22 to 130 seven hr. exposures	Inhalation	0	100%	26 wks.
	1 rabbit	----	----	6 ml., 1 hr. contact daily for 16 days	Skin	0	----	2 mos.
	2 rabbits	----	----	0.035 gm. per kg. daily, 5 - 6 days per wk. in propylene glycol, 30 - 32 doses	P.O.	0	100%	2 mos.
238. --1, 1, 1-TRICHLOROETHANE CH_3CCl_3								
Adams et al., 1950	14 guinea pigs	----	M&F	650 p.p.m., 41 seven hr. exposures	Inhalation	0	----	58 d.
	19 guinea pigs	----	M&F	650 p.p.m., 66 seven hr. exposures	Inhalation	0	----	93 d.
	20 guinea pigs	----	F	1500 p.p.m., 44 seven hr. exposures	Inhalation	0	----	60 d.
	1 monkey	----	F	3000 p.p.m., 53 seven hr. exposures	Inhalation	0	----	74 d.
	13 rats	----	M&F	3000 p.p.m., 48 seven hr. exposures	Inhalation	0	----	67 d.
	2 rabbits	----	F	5000 p.p.m., 31 seven hr. exposures	Inhalation	0	100%	44 d.
	10 guinea pigs	----	M&F	5000 p.p.m., 32 seven hr. exposures	Inhalation	0[235a]	100%	45 d.
	10 rats	----	M&F	5000 p.p.m., 31 seven hr. exposures	Inhalation	0	2 died	44 d.
239. --β, β, β-TRICHLOROETHYL CARBAMATE $H_2N\text{-}COOCH_2CCl_3$								
Larsen, 1947	Mice	A	----	----	Inj.	Tumors[54]	----	----
240. --TRICHLOROETHYLENE $CHCl{=}CCl_2$								
Adams et al., 1951	12 rats	Wistar	M&F	3000 p.p.m., 27 exposures	Inhalation	0	3 died	36 d.
	11 guinea pigs	----	M&F	100 p.p.m., 132 exposures	Inhalation	0	----	185 d.
	2 monkeys	Rhesus	M	200 p.p.m., 148 exposures	Inhalation	0	----	212 d.
	4 rabbits	----	M&F	200 p.p.m., 178 exposures	Inhalation	0	----	248 d.

[54] Of the lung.

[235a] Fatty degeneration of the liver.

Reference	Animal	Strain or type	Sex	Preparation and dose	Site and route	Animals with tumors	Survival	Duration of experiment
240.--TRICHLOROETHYLENE--Continued $CHCl=CCl_2$								
Adams et al., 1951	16 guinea pigs	----	M&F	200 p.p.m., 163 exposures	Inhalation	0	----	227 d.
	30 rats	Wistar	M&F	200 p.p.m., 151 exposures	Inhalation	0	----	205 d.
	1 monkey	Rhesus	M	400 p.p.m., 161 exposures	Inhalation	0	----	225 d.
	4 rabbits	----	M&F	400 p.p.m., 161 exposures	Inhalation	0	----	225 d.
	16 guinea pigs	----	M&F	400 p.p.m., 167 exposures	Inhalation	0	----	235 d.
	30 rats	Wistar	M&F	400 p.p.m., 173 exposures	Inhalation	0	----	243 d.
	2 rabbits	----	M	3000 p.p.m., 27 exposures	Inhalation	0	100%	36 d.
241.--TRIETHYLAMINE $(C_2H_5)_3N$								
Brieger and Hodes, 1951	6 rabbits	----	----	50 and 100 p.p.m., 7 hrs. per d., 5 d. per wk. for 6 wks.	Inhalation	0	100%	6 wks.
242.--TRIS(β-CHLOROETHYL)AMINE $N(CH_2CH_2Cl)_3$								
Griffin et al., 1951a	Mice	Swiss	----	One mg. or repeated weekly injs., 1-40 wks.	I.V., S.C., or I.P.	Tumors[198]	----	1 yr.
	Rats	Albino	----	One mg. or repeated weekly inj., 1-40 wks.	I.V., S.C., or I.P.	0[198a]	----	1 yr.
243.--TRIS(β-CHLOROETHYL)AMINE HYDROCHLORIDE $N(CH_2CH_2Cl)_3 \cdot HCl$								
Boyland and Horning, 1949	20 mice	Stock	----	1 mg. per 10 ml. aqueous, 1.0 mg. per kg. body wt. weekly for 50 wks.	S.C.	3[236]	4 alive at 280 d.	567 d.
Griffin et al., 1950	Mice	Swiss	----	0.5 mg. per kg. body wt. in saline once or weekly for 5 to 9 mos.	I.V., I.P., and S.C.	Tumors[237]	----	9 mos.
	Rats	Albino	----	0.5 mg. per kg. body wt. in saline once or weekly for 5 to 9 mos.	I.V., I.P., and S.C.	Tumors[237]	----	9 mos.
244.--UNDECYLENIC ACID $CH_2=CH(CH_2)_8COOH$								
Newell et al., 1949	Rats	Sprague-Dawley	M	0.5, 1.0 or 2.5% in the diet	P.O.	0[237a]	----	Over 8 wks.
245.--VACCENIC ACID $CH_3(CH_2)_5CH=CH(CH_2)_9COOH$								
von Euler et al., 1948	32 rats	Albino	M&F	0.3% in diet	P.O.	0	----	52 d.

[198] Adenocarcinoma of lungs, leukemia, angioma, angiosarcoma and osteogenic sarcoma.
[198a] Pathological findings not discussed.
[236] 1 lung adenoma, 2 lung carcinomas, 1 sarcoma at site of injection.
[237] In 15-20% of the animals; tumors appeared 4 to 8 months after injection (fibroadenoma, lymphosarcoma and adenocarcinoma).
[237a] No pathology report.

Reference	Animal	Strain or type	Sex	Preparation and dose	Site and route	Animals with tumors	Survival	Duration of experiment
246.--VINYL CHLORIDE POLYMER $-(CH_2CHCl)_x-$								
Oppenheimer et al., 1952	45 rats	Wistar	----	Film	S.C.	Tumors[238]	44 alive at 189 d.	Over 22 mos.
247.--VINYL PROPIONATE $CH_3CH_2COOCH=CH_2$								
Ambrose, 1950a	5 rats	Albino	F	0.64% in the diet	P.O.	0	----	392 d.
	45 rats	Albino	F	0.05 - 2.56%	P.O.	0	----	223 d.
248.--ZINC DIMETHYLDITHIOCARBAMATE $Zn[-S-CS-N(CH_3)_2]_2$								
Hodge et al., 1952a	Dogs	----	----	5 or 25 mg. per kg. by capsule daily for 1 mo.	P.O.	0	100%	1 mo.
	40 rats	Rochester	M&F	0.01 - 0.5% in the diet	P.O.	0	----	1 mo.
249.--ZINC ETHYLENE BISDITHIOCARBAMATE[239] $(CH_2)_2(NH-CS-S-)_2Zn$								
Smith, Jr., et al., 1953	200 rats	Albion	M&F	500 - 10,000 p.p.m. in the diet	P.O.	0[240]	Sacrificed at various intervals	30 d.
	100 rats	Albino	M&F	500 - 10,000 p.p.m. in the diet	P.O.	0[241]	13 died by 52 wks.	2 yrs.
	9 dogs	Mongrel	----	20 - 10,000 p.p.m. in the diet	P.O.	0[242]	100%	1 yr.

[238] 14 sarcomas, 12 fibrosarcomas, 1 liposarcoma, 1 unclassified malignancy. First tumor at 189 days.

[239] Marketed as Dithane Z78.

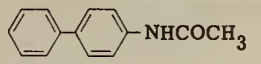
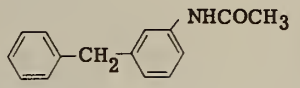
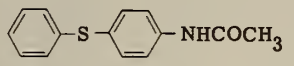
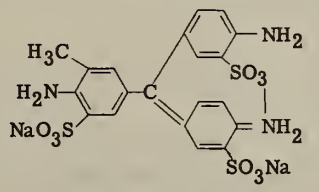
[240] 10 rats at the 10,000 p.p.m. level had thyroid hyperplasia.

[241] 9 lung tumors, 1 adrenal tumor, 1 small bowel tumor, 1 mammary carcinoma and 1 adenocarcinoma of thyroid in 100 treated rats. Considered spontaneous. 2 lung tumors in 20 controls.

[242] 10,000 p.p.m. induced thyroid hyperplasia.

Reference	Animal	Strain or type	Sex	Preparation and dose	Site and route	Animals with tumors	Survival	Duration of experiment
250.--4-ACETAMIDOTETRAPHENYLMETHANE $(C_6H_5)_3C-C_6H_4-NHCOCH_3$								
Rudali, et al., 1952	9 rats	Wistar	----	0.05% in the diet for 115 d.	P.O.	0	----	At least 385 d.
	10 rats	Wistar	----	0.05% in the diet for 155 d.	P.O.	0	----	At least 280 d.
251.--4-ACETAMINOSTILBENE $C_6H_5-CH=CH-C_6H_4-NHCOCH_3$								
Danneberg (unpub. data)	20 rats	BD I and BD III	----	0.6 mg. daily (total dose 155 mg.)	P.O.	8[243]	14 alive after 1 yr.	18 mos.
252.--p-ACETYLAMINOBENZALDEHYDE THIOSEMICARBAZONE[244] $CH_3CONH-C_6H_4-CH=N-NHCSNH_2$								
Francis et al., 1950	3 dogs	----	----	500 mg. per kg., 1 or 2 times daily	P.O.	0	----	53 d.
Kondo, 1951	Rabbits	----	----	1 - 4 mg. per kg. or 10 mg. per kg., daily inj. as a propylene glycol soln.	S.C.	0	----	50 d.
253.--p-ACETYLAMINOBENZOIC ACID $CH_3CONH-C_6H_4-COOH$								
Hung and Delost, 1952	Rats	Comentry	M	2.5% in the diet	P.O.	0	----	1 mo.
254.--4-ACETYLAMINOBIPHENYL $C_6H_5-C_6H_4-NHCOCH_3$								
Rudali and Royer, 1952	10 rats	----	M	1 mg. (repeated doses) for 1 yr.	I.M.	0	6 alive at 390 d.	440 d.
	10 rats	----	----	0.1% then 0.2% in the diet (10.15 g. food a day per rat)	P.O.	0	----	1 yr.
	8 mice	----	M	0.2 ml. (1.5% in oil) twice weekly for 6 mos.	P.O.[23]	0	75% alive at 1 yr.	1 yr.
	10 mice	----	----	0.04% in the diet for 150 d. Diet deficient in vitamin B.	P.O.	0	5 alive over 100 d.	300 d.
	20 mice	----	M	0.3% in acetone or 0.3% in alcohol twice weekly for 7 mos.	Skin	0	11 alive over 200 d.	300 d.

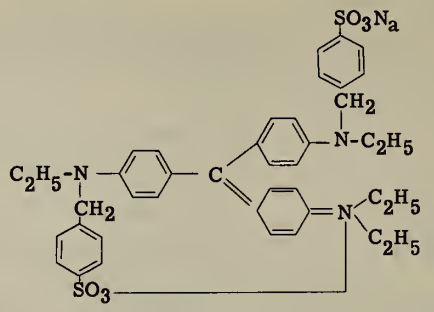
[23] Stomach tube.
[243] Histology considered certain.
[244] Tibione.

Reference	Animal	Strain or type	Sex	Preparation and dose	Site and route	Animals with tumors	Survival	Duration of experiment
254. --4-ACETYLAMINOBIPHENYL--Continued 								
Sandin et al., 1952	15 rats	----	M	1.62 m.mols per kg. in the diet for 8 mos.	P.O.	0	----	10 mos.
	15 rats	----	F	1.62 m.mols per kg. in the diet for 8 mos.	P.O.	Tumors[245]	----	10 mos.
Tuba et al., 1953	36 rats	Wistar	F	0.05% in the diet	P.O.	Tumors[246]	----	15 mos.
Miller et al., 1955	17 rats	Holtzman	F	1.62 m.mols per kg. of diet for 8 mos.	P.O.	Tumors[247]	----[248]	At least 8 mos.
	17 rats	Holtzman	M	1.62 m.mols per kg. of diet for 8 mos.	P.O.	0	----[248]	At least 8 mos.
Druckrey et al. (unpub. data)	16 rats	BD I and BD III	----	6 mg. daily (total dose 1.1 g.)	P.O.	5[249]	9 alive after 1 yr.	32 mos.
255. --3-ACETYLAMINODIPHENYLMETHANE 								
Miller et al., 1955	18 rats	Holtzman	M&F	1.62 m.mols per kg. of diet for 8 mos.	P.O.	0	----	At least 8 mos.
256. --4-ACETYLAMINODIPHENYLSULFIDE 								
Miller et al., 1955	9 rats	Holtzman	M	1.62 m.mols per kg. of diet for 8 mos.	P.O.	Tumors[250]	----	At least 8 mos.
	9 rats	Holtzman	F	1.62 m.mols per kg. of diet for 8 mos.	P.O.	Tumors[251]	----	At least 8 mos.
257. --ACID FUCHSIN  (in part)								
Willheim and Ivy, 1953	10 rats	Wistar	M&F	4% of the diet	P.O.	0	----	18 mos. to 2 yrs.

[245] 11 mammary and 2 ear duct.
[246] 1 mammary fibroadenoma at 13 months, 3 bladder tumors at 12 to 15 months. (Not studied histologically)
[247] Mammary gland tumors: 7 at 5 months, 8 at 8 months, 12 at 10 months, 3 ear duct tumors at 10 months, 1 leiomysarcoma of uterus found at 8 months.
[248] 2 negative deaths at 8 months.
[249] 1 carcinoma of the skin and 4 adenomas of the mammary gland after 4 until 13 months. Etiology considered certain.
[250] 1 adenocarcinoma of the small intestine at 10 months. 1 scirrhous carcinoma.
[251] 1 mammary gland tumor at 10 months.

Reference	Animal	Strain or type	Sex	Preparation and dose	Site and route	Animal with tumors	Survival	Duration of experiment

258.--ACID VIOLET 5 BN[252]



Miller (unpub. data)	10 rats	Scott Hooded	M&F	Feeding and drinking on alternate wks. 1.25% aqueous ad lib. in water or 200 mg. per rat in the diet, 6 d. per wk.	P.O.	0	----	29 mos.
	Mice	A_2G	M&F	1.25% aqueous, ad lib. in water	P.O.	0	----	28 mos.
	Mice	A_2G	M&F	Saturated soln. in acetone for 7 wks., then saturated soln. in isopropyl alcohol for 13 mos., then saturated soln. in 90% ethyl alcohol for 6 mos.	Skin	0[253]	----	28 mos.
	Mice	A_2G	M&F	0.5 cc. 2.5% suspension in arachis oil per mouse weekly (12.5 mg. dye per mouse per inj., up to 33 injs.)	S.C.	0	----	28 mos.
	Mice	A_2G	M&F	5.0% aqueous soln. on bread, 100 mg. dye per mouse, daily except Sundays	P.O.	0	----	28 mos.

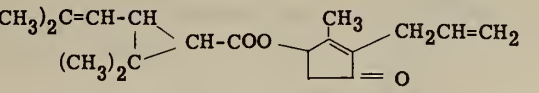
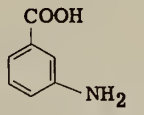
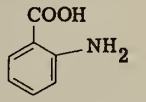
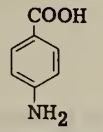
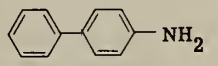
259.--ALKYL DIMETHYL BENZYL AMMONIUM CHLORIDE $R(CH_3)_2C_6H_5CH_2NCl$

Fitzhugh and Nelson, 1948b	12 rats	Osborne-Mendel	M	0.5% in the diet	P.O.	0	All died within 12 wks.	12 wks.
	12 rats	Osborne-Mendel	M	0.25% in the diet	P.O.	0	7 alive at 1 yr.	2 yrs.
	24 rats	Osborne-Mendel	M	0.063% or 0.125% in the diet	P.O.	0	20 alive at 1 yr.	2 yrs.
Alfredson et al., 1951	66 rats	Albino	----	0.015 - 1.0% in the diet[253a]	P.O.	0	6 died	12 wks.
	168 rats	Albino	M&F	0.015 - 0.5% in the diet	P.O.	0	32.7% alive	2 yrs.
	7 dogs	Mongrels	----	0.031 - 1.0% in the diet	P.O.	0	3 died	15 wks.

[252] Color index No. 698.

[253] 1 leukemia in a female at 21.5 months, not considered significant by author.

[253a] Trade name: Roccal, Sterwin Chemicals, Inc.

Reference	Animal	Strain or type	Sex	Preparation and dose	Site and route	Animals with tumors	Survival	Duration of experiment
260. --ALLETHRIN[254] 								
Carpenter et al., 1950	55 rats	Sherman	M&F	Aerosol, one or two half-hour exposures per d.	Inhalation	0	----	67 d.
261. --m-AMINOBENZOIC ACID 								
Ekman and Strömbeck, 1949a	12 rats	----	M&F	0.2% in the diet for 84 to 262 d.	P.O.	0[255]	----	At least 262 d.
262. --o-AMINOBENZOIC ACID 								
Ekman and Strömbeck, 1949a	12 rats	----	M&F	0.2% in the diet for 33 to 324 d.	P.O.	Tumors[256]	----	At least 324 d.
263. --p-AMINOBENZOIC ACID 								
Handler and Follis, 1948	8 rats	Vanderbilt	M	2.0% in the diet. Diet choline deficient.	P.O.	0[257]	100%	120 d.
	9 rats	Vanderbilt	M	2.0% in the diet. Diet choline deficient.	P.O.	0[257]	1 died	120 d.
Hung and Delost, 1952	Rats	Comentry	M	2% in the diet	P.O.	0	----	1 mo.
264. --4-AMINODIPHENYL 								
Walpole et al., 1952	23 rats	Albino stock	M&F	In arachis oil daily 5 d. per wk. (Mean total dose 3.6 to 5.8 mg. per kg. body weight)	S.C.	Tumors[258]	14 alive at 500 d.	At least 537 d.

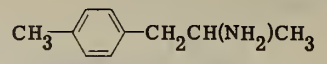
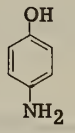
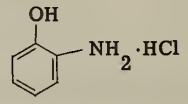
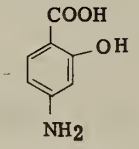
[254] Esterification of dl-2-allyl-4-hydroxy-3-methyl-2-cyclopenten-1-one with a mixture of cis and trans chrysanthemum - monocarboxylic acids.

[255] 5 rats with metaplasia of bladder epithelium.

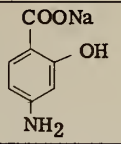
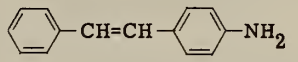
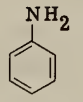
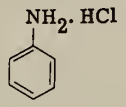
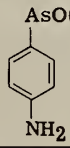
[256] 3 with bladder papillomas.

[257] Thyroid hyperplasia.

[258] 4 local sarcomas (5 occurred in controls with sesame oil only), 1 benign hepatoma, 1 benign cholangioma, 1 reticulosis, 1 sarcoma of liver, 7 intestinal, 3 mammary, 1 adenoma of kidney, 2 carcinoma of uterus.

Reference	Animal	Strain or type	Sex	Preparation and dose	Site and route	Animal with tumors	Survival	Duration of experiment
265.--2-AMINO-1-(p-METHYLPHENYL)-PROPANE 								
Fellows et al., 1950a	17 rats	----	----	30.0 mg. per kg. daily	P.O.	0	----	1 mo.
	15 guinea pigs	----	----	7.5 mg. per kg. daily	I.P.	0	----	1 mo.
	9 rabbits	----	----	10.0 mg. per kg. daily	I.P.	0	----	1 mo.
	44 rats	----	----	3.6 - 25.0 mg. per kg. daily	P.O.	0	----	3 mos.
	4 dogs	----	----	2.4 - 4.8 mg. per kg. daily	P.O.	0	----	3 mos.
266.--p-AMINOPHENOL 								
Miller and Miller, 1948	12 rats	Sprague-Dawley	M	0.087% in the diet for 9 mos.	P.O.	0	----	9 mos.
Ekman and Strömbeck, 1949a	12 rats	----	M&F	0.2% in the diet for 127 to 341 d.	P.O.	0	----	At least 341 d.
Ekman and Strömbeck, 1949b	10 rats	Albino	----	0.2% in the diet	P.O.	0	----	----
267.--o-AMINOPHENOL HYDROCHLORIDE 								
Miller and Miller, 1948	12 rats	Sprague-Dawley	M	0.117% in the diet for 9 mos.	P.O.	0	----	9 mos.
268.--p-AMINOSALICYLIC ACID 								
Capraro and Barilli, 1950	70 rats	Albino	F	0.25 - 0.1% in diet	P.O.	0	----	50 d.
Mouriquand and Edel, 1951	Guinea pigs	----	----	0.50 gm. per d. in the diet	P.O.	0	----	400 d.
Bavin and James, 1952	40 rats	Wistar	F	1 mg. per gm. body wt. per d. for 25 to 30 wks.[259]	P.O.[23]	0[257]	----	35 wks.

[23] Stomach tube.
[257] Thyroid hyperplasia.
[259] Comparison made of fresh solutions and those left standing up to 6 months.

Reference	Animal	Strain or type	Sex	Preparation and dose	Site and route	Animals with tumors	Survival	Duration of experiment
269.--p-AMINOSALICYLIC ACID, SODIUM SALT 								
Beattie and Chambers, 1953	4 rats	Albino	----	0.5 mg. per gm. per d.	P.O.[23]	0	----	175 d.
270.--4-AMINOSTILBENE 								
Schmahl (unpub. data)	29 rats	BD III & Wistar	----	1 mg. daily (total dose 270 mg.)	P.O.	4[263]	0 alive after 1 yr.	10 mos.
271.--ANILINE 								
Ekman and Strömbeck, 1949b	12 rats	Albino	M&F	1.10% in a synthetic basic diet, 10-15 mg. per day per body wt.	P.O.	4[264]	5 died early	331 d.
	20 rats	Albino	M	5.0 to 7.5 mg. daily in rice diet for 144 to 256 d.	P.O.	0	50% died early	256 d.
	10 rats	Albino	M&F	0.1% in basic diet	P.O.	2[265]	----	312 d.
Gehrmann et al., 1949	3 dogs	----	----	300 mg. daily	P.O.	0	----	3.33 yrs.
272.--ANILINE HYDROCHLORIDE 								
Druckrey, 1950a	50 rats[266]	----	----	22 mg. a day in drinking water (max. total dose 14 g.)	P.O.	0	Most died by 425 d.	750 d.
Druckrey, 1950b	50 rats	----	----	22 mg. daily	P.O.	0	----	750 d.
273.--ARSANILIC ACID 								
Hendrick et al., 1953	11 rats	Sprague-Dawley	M&F	Equivalent of 5, 31 or 86 p.p.m. arsenic in the diet	P.O.	0[265a]	100%	60 d.

[23] Stomach tube.

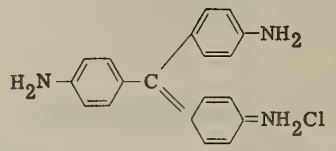
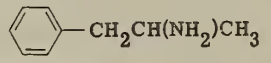
[263] Carcinomas of the acoustic duct, three further rats with bile-duct cysts after 7 months. Etiology considered uncertain.

[264] Papillomas and metaplasia of bladder.

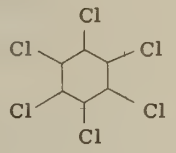
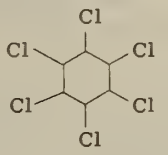
[265] Metaplasia and papillomas of the bladder.

[265a] No pathological report.

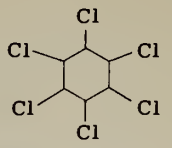
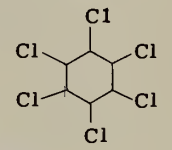
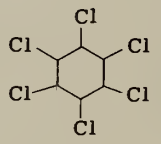
[266] 100 days old.

Reference	Animal	Strain or type	Sex	Preparation and dose	Site and route	Animal with tumors	Survival	Duration of experiment
274.--AUROTHIOGLYCOLANILIDE[266a] $C_2H_5NHCOCH_2S$-Au								
Margolis et al., 1949	7 rabbits	----	----	200 mg. pellet	I.M.	0	6 killed by 68 d.	17 mos.
275.--BASIC FUCHSIN 								
Willheim and Ivy, 1953	10 rats	Wistar	M&F	4% of the diet	P.O.	0	----	18 mos. to 2 yrs
276.--BENADRYL $(C_6H_5)_2CH$-O-$CH_2CH_2N(CH_3)_2 \cdot HCl$								
Ercoli et al., 1948	6 rabbits	----	----	6 - 8 mg. per kg., 5 d. per wk. for 6 wks.	I.V.	0	4 alive at 6 wks.	6 wks.
	10 rats	----	M&F	20 mg. per kg., 5 times a wk. for 3 mos.	P.O.[23]	----	----	3 mos.
277.--BENZEDRINE 								
Jasmin and Gosselin, 1953	10 rats[268]	Piebald	F	Twice daily, 5 mg. total dose for 50 d., plus 1% sodium chloride in water	S.C.	0	100%	50 d.
278.--BENZENE								
Pecora, 1949a	Rabbits	----	----	1 cc. per kg. body wt. of 40% oily soln. on alternating days, plus 0.1 gm. of ascorbic acid	I.M.	0[269]	----	----
	5 rabbits	----	----	1 cc. per kg. body wt. of 40% oily soln. on alternating days		0[269]	----	----
Pecora, 1949b	1 rabbit	----	----	1 cc. per kg. body wt. of 40% oily soln. on alternate days for 30 d.	I.M.	0[269]	----	30 d.
Dietz and Steinberg, 1950	1 rabbit	----	----	75 mg. per 100 g. body wt. in olive oil, 23 times	S.C.	0	----	41 d.
Fabre et al., 1952	2 rabbits	----	----	9.5 mg. per liter, 8 hrs. per d., 6 d. per wk. for 40 d.	Inhalation	0	----	40 d.

[23] Stomach tube.
[266a] Lauron.
[268] Nephrectomized.
[269] No pathology report.

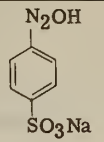
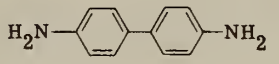
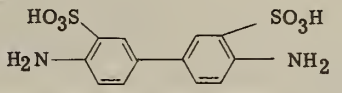
Reference	Animal	Strain or type	Sex	Preparation and dose	Site and route	Animal with tumors	Survival	Duration of experiment
278.--BENZENE--Continued								
Weil et al. (unpub. data)	30 mice	RAP	M	Painted 3 times weekly	Skin	Tumors[270]	----	1 yr.
	30 mice	C3H	M	Painted 3 times weekly	Skin	0	----	1 yr.
279.--BENZENE DIAZONIUM HYDROXIDE								
Boyland and Sargent, 1951	15 mice	C57	----	0.02 molar in aqueous soln., 0.05 ml. in 60 sites	Intradermal	0	----	At least 60 d.
280.--BENZENE HEXACHLORIDE, α ISOMER 								
Fitzhugh et al., 1950a	80 rats	Wistar	M&F	10, 50, 100 and 800 p.p.m. in the diet	P.O.	0	----	107 wks.
Davidow and Frawley, 1951	Dog	----	----	60 mg. per kg. in gelatin capsules	P.O.	0	----	12 wks.
281.--BENZENE HEXACHLORIDE, β ISOMER 								
Fitzhugh et al., 1950a	60 rats	Wistar	M&F	10, 100, 800 p.p.m. in the diet	P.O.	0	----	107 wks.
Davidow and Frawley, 1951	Rats	Osborne-Mendel	----	100 p.p.m. in the diet	P.O.	0	Sacrificed at various intervals	20 mos.
	Dogs	----	----	24 and 30 mg. per kg. in gelatin capsules	P.O.	0	----	20 wks.

[271] 6 hepatomas, 32 ear duct carcinomas.

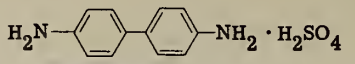
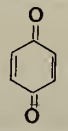
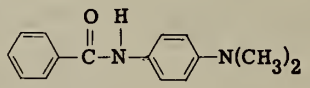
Reference	Animal	Strain or type	Sex	Preparation and dose	Site and route	Animals with tumors	Survival	Duration of experiment
282.--BENZENE HEXACHLORIDE, γ isomer 								
Laug, 1948	Rats	----	M&F [267a]	20, 500, 1000 p.p.m. in the diet up to 114 d.	P.O.	0	----	114 d.
Orr, 1948	30 mice	Stock	----	5% in acetone twice weekly for 15 mos.	Skin	0[267]	21 alive at 15 mos.	15 mos.
	20 mice	Stock	----	Pellets with 3% in paraffin wax	S.C.	0	12 alive at 10 mos.	10 mos.
Dallemagne et al., 1950a	Dogs	----	----	10 - 30 mg. per kg. in 10% oily soln.	I.M.	0	----	44 d.
Dallemagne et al., 1950b	Dog	----	----	10% in oil, 10 - 50 mg. per kg. per d. (total dose 130 - 475 mg. per kg.)	I.M.	0	----	46 d.
Dallemagne et al., 1950c	Dogs	----	----	10 - 30 mg. in 10% oil soln. per kg. body wt. (to total dose of 130 - 475 mg. per kg.)	I.M.	0	----	44 d.
Fitzhugh et al., 1950a	200 rats	Wistar	M&F	5 - 1600 p.p.m. in the diet	P.O.	0	----	107 wks.
Davidow and Frawley, 1951	Dog	----	----	10 - 15 mg. per kg. in gelatin capsules	P.O.	0	----	7 wks.
283.--BENZENE HEXACHLORIDE, δ ISOMER 								
Davidow and Frawley, 1951	Dogs	----	----	120 mg. per kg. in gelatin capsules	P.O.	0	----	20 wks.
284.--BENZENE HEXACHLORIDE, MIXED ISOMERS 								
Fitzhugh et al., 1950a	80 rats	Wistar	M&F	10, 50, 100 and 800 p.p.m. in the diet	P.O.	0	----	107 wks.
Davidow and Frawley, 1951	Rats	Osborne-Mendel	----	800 p.p.m. in the diet	P.O.	0	Sacrificed at various intervals	20 mos.

[267] 1 leukemia and mammary carcinoma considered spontaneous.

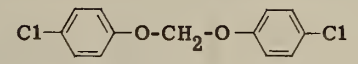
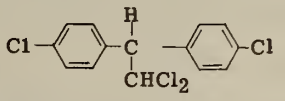
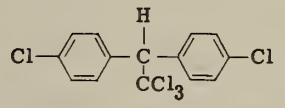
[267a] Normal males and castrate females.

Reference	Animal	Strain or type	Sex	Preparation and dose	Site and route	Animals with tumors	Survival	Duration of experiment
285.--p-BENZENESULPHONIC ACID DIAZONIUM HYDROXIDE, SODIUM SALT 								
Boyland and Sargent, 1951	6 mice	Stock	----	0.02 molar in aqueous soln., 0.05 ml. in 24 sites	Intradermal	0	----	----
286.--BENZIDINE 								
Gehrmann et al., 1949	4 dogs	----	----	117 mg. daily	P.O.	0	----	5 yrs.
Spitz et al., 1950	152 rats	Sherman	M&F	15 mg. in 1 cc. olive oil or butyl succinate once weekly (total 0.96 gm.)	S.C.	Tumors[271]	24 alive at 300 d.	600 d.
	233 rats	Sherman	M&F	15 mg. in 1 cc. olive oil or butyl succinate once weekly (total 1.28 gm.)	S.C.	Tumors[272]	36 alive at 300 d.	600 d.
	7 dogs	Mongrels	M&F	200 mg. in capsule daily (6 d. per wk.) for 15 mos. followed by 300 mg. in capsule daily (6 d. per wk.) for 45 mos. (total 325 gm.)	P.O.	1[273]	6 alive at 97 mos.	97 mos.
	4 monkeys	Macacus rhesus	F	50 to 200 mg. in butyl succinate weekly for 2 to 5 yrs. (total 6.2 to 9.1 gm.)	S.C.	0	All dead at 62 mos.	62 mos.
	22 rabbits	----	F	75 to 150 mg. in olive oil weekly (total 0.75 to 6.8 gm.)	S.C.	0	50% died by 100 d.	500 d.
Boyland and Sargent, 1951	6 mice	Stock	----	1.8 mg. per ml. in N/40 HCl., 0.05 ml. of soln. in 24 sites	Intradermal	0	----	----
Zylberszac, 1951	150 rats	White and black	M	35 mg. tablets, 4 - 6 implants at 12 - 15 day intervals	S.C.	0[274]	----	5 mos.
287.--BENZIDINE DISULFONIC ACID 								
Spitz et al., 1950	59 rats	Sherman	M&F	20 mg. in 1 cc. olive oil or butyl succinate once weekly (total 2.8 gm.)	S.C.	0	43 alive at 300 d.	600 d.

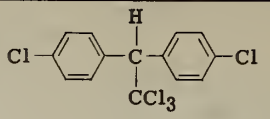
[271] 6 hepatomas, 32 ear duct carcinomas.
[272] 8 hepatomas, 54 ear duct carcinomas, 7 adenocarcinomas of the colon.
[273] Epidermoid carcinoma of the bladder.
[274] Hepatic cirrhosis.

Reference	Animal	Strain or type	Sex	Preparation and dose	Site and route	Animals with tumors	Survival	Duration of experiment
288.--BENZIDINE SULPHATE 								
Spitz et al., 1950	4 dogs	Mongrel	F	200 mg. in capsule daily (6 d. per wk.) for 15 mos., followed by 300 mg. in capsule daily (6 d. per wk.) for 45 mos. (total 400 gm.)	P.O.	0	All alive at 7 yrs.	7 yrs.
	37 rats	Sherman	M&F	In the diet	P.O.	Tumors[275]		
	153 rats	Sherman	M&F	15 mg. in 1 cc. olive oil or butyl succinate once weekly (total 0.94 gm.)	S.C.	Tumors[276]	5 alive at 300 d.	600 d.
289.--BENZOQUINONE 								
Boyland and Sargent, 1951	8 mice	ABC	----	0.8 mg. per ml. in water, 0.05 ml. of soln. in 8 sites	Intradermal	0	----	At least 69 d.
Tiedemann, 1953	80 mice	Albino	----	1% in benzene daily	Skin	Pap.[276b]	42 alive at 200 d., 28 alive at 300 d.	478 d.
290.--N'-BENZOYL-N,N-DIMETHYL-p-PHENYLENEDIAMINE 								
Miller and Miller, 1948	6 rats	Sprague-Dawley	M	0.064% in the diet for 6 mos.	P.O.	0	----	9 mos.
291.--BENZOYL PEROXIDE $(C_6H_5CO)_2O_2$								
Boyland and Sargent, 1951	14 mice	B	----	0.02 or 0.04 molar in arachis oil, 0.05 ml. in 6 or 32 sites	Intradermal	0	----	At least 40 d.
292.--BENZYL BENZOATE								
Draize et al., 1948	40 rats	----	----	Undiluted, daily	Skin	0	----	90 d.
	30 rabbits	----	----	Undiluted, daily	Skin	0	----	90 d.
	50 mice	----	----	Undiluted, daily	Skin	0	----	90 d.
	50 guinea pigs	----	----	Undiluted, daily	Skin	0	----	90 d.

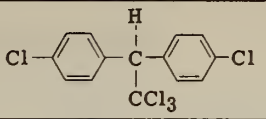
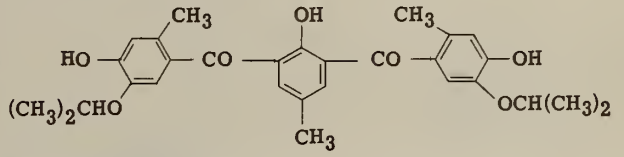
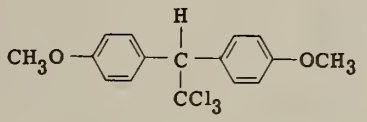
[275] 1 hepatoma, 2 ear duct carcinomas.
[275a] Not sacrificed, no pathology.
[276] 1 hepatoma, 16 ear duct carcinomas.
[276b] Benzene treated controls also had papillomas.

Reference	Animal	Strain or type	Sex	Preparation and dose	Site and route	Animals with tumors	Survival	Duration of experiment
293.--N-BENZYL-β-CHLOROPROPIONAMIDE								
Harned et al., 1953	4 dogs	----	----	100 mg. per kg. three times daily for 13 wks.	P.O.	0[275a]	100% survived	Over 13 wks.
	15 rats	----	----	250 mg. per kg. per d.	P.O.[23]	0	----	12 wks.
	25 mice	----	----	250 mg. per kg. per d.	P.O.	0	----	13 wks.
	8 dogs	----	M&F	100 mg. per kg. 2 or 3 times daily for 52 wks.	P.O.	0	----	1 yr.
	120 rats	Wistar	M&F	500, 100 or 1500 mg. per kg. per day in the diet	P.O.	0	2 died during the experiment	13 mos.
294.--BIS(p-CHLOROPHENOXY)METHANE 								
Spencer et al., 1950a	20 rats	Wistar	M	0.1, 0.3, 1.0 and 4.0% in the diet	P.O.	0	1 died	51 d.
295.--2, 2-BIS (p-CHLOROPHENYL)-1, 1-DICHLOROETHANE[276a] 								
Haag et al., 1948	63 rats	Albino	M	150 - 10,000 p.p.m. in Pyrax in the diet	P.O.	0	38 died	52 wks.
Nelson and Woodard, 1948	11 dogs	----	----	Capsules dissolved in corn oil, 50 to 200 mg. per kg. per day for period of 1 to 21 mos.	P.O.	0[277]	2 alive	Over 21 mos.
Nelson and Woodard, 1949	11 dogs	Mongrel and Irish Terrier	M&F	50 - 200 mg. per kg. in capsules, 5 d. per wk.	P.O.	0	7 died	Over 38 mos.
296.--2, 2-BIS(p-CHLOROPHENYL)-1, 1, 1-TRICHLOROETHANE[277a] 								
Globus, 1948	6 rats	----	----	100 - 800 p.p.m. mixed with diet	P.O.	0	----	2 yrs.
	1 cat	----	----	50 mg. per kg. body wt., one dose emulsion in peanut oil, saline and 1% lecithin	I.V.	0	----	160 d.
	1 cat	----	----	75 mg. per kg. body wt., one dose emulsion in peanut oil, saline and 1% lecithin	I.V.	0	----	49 d.
	3 dogs	----	----	80 mg. per kg. per day in corn oil	P.O.[23]	0	----	15 mos.
	2 monkeys	----	----	50 mg. per kg. per day in olive oil	P.O.	0	----	75 d.

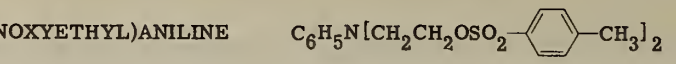
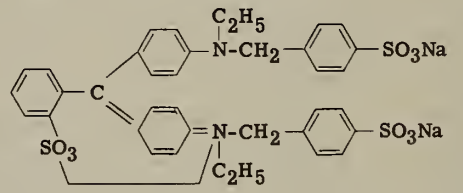
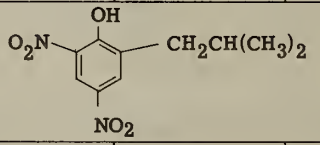
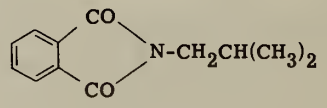
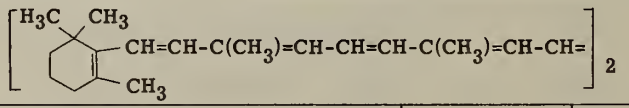
[23] Stomach tube.
[275a] Not sacrificed, no pathology.
[276a] DDD.
[277] Liver damage and adrenal cortical atrophy.
[277a] DDT

Reference	Animal	Strain or type	Sex	Preparation and dose	Site and route	Animals with tumors	Survival	Duration of experiment
296.--2, 2-BIS(p-CHLOROPHENYL)-1, 1, 1-TRICHLOROETHANE--Continued 								
Haag, et al., 1948	42 rats	Albino	M	150 - 2500 p.p.m. in Pyrax in the diet	P.O.	0	32 died	52 wks.
	2 dogs	----	----	460 gm. per hrs., dust	Inhalation	0	1 died	5 wks.
Stohlman and Lillie, 1948	18 rabbits	----	M&F	5% in olive oil, average 15.6 doses	P.O.	0	----	45.8 d.
Bennison and Mostofi, 1950	14 mice	C	M&F	5% in kerosene weekly	Skin	0	----	55 wks.
Burlington and Lindeman, 1950	40 chicks	White leghorn	M	15 mg. per kg. to 300 mg. per kg. body wt. daily in chicken fat	S.C.	0[278]	----	89 d.
Deichmann et al., 1950	12 rabbits	----	----	5% in different solvents, 5 cc. per kg. body wt., 5 times weekly	Skin	0	----	34 d.
	20 rats	----	----	0.004 - 0.008 mg. per liter of air	Inhalation	0	All alive at 103 d.	103 d.
	38 mice	----	----	0.004 - 0.008 mg. per liter of air	Inhalation	0	All alive at 103 d.	103 d.
	100 rats	----	----	8.7 - 120 mg. per kg. body wt. daily	P.O.	0	63 alive	26 wks.
	30 rats	----	M&F	30 or 150 p.p.m. in food	P.O.	0	----	2 yrs. 53 d.
	36 rats	----	M	10 - 150 p.p.m. in food	P.O.	0	----	2 yrs. 5 d.
Gerebtzoff et al., 1950	2 dogs	----	----	100 mg. per kg. per day (10% in oil) for 30 d.	I.M.	0	----	----
Haag et al., 1950	2 rabbits	----	----	0.45 mg. per liter air, 2 hrs per day, 5 days per wk.	Inhalation	0	1 died	5 wks.
	2 dogs	----	----	0.45 mg. per liter air, 2 hrs. per day, 5 days per wk.	Inhalation	0	100% survival	5 wks.
	28 rats	Albino	M	300 - 1800 p.p.m. in the diet	P.O.	0[279]	8 alive at 52 wks.	1 yr.
	12 rabbits	Albino	----	30% soln. in dimethyl phthalate daily, 5 d. per wk. (0.125, 0.25, 0.5, 1.0 ml. per kg.)	Skin	0	4 died	13 wks.
Laug et al., 1950	Rats	----	M&F	1.0 - 50.0 p.p.m. in the diet for 15 to 27 wks.	P.O.	0	----	27 wks.
Stohlman et al., 1950	12 rats	----	M	0.05% in the diet	P.O.	0	100% survival	100 d.
	12 rats	----	M	0.1% in the diet	P.O.	0	69% died at 70 d.	100 d.
	12 rats	----	M	0.12% in the diet	P.O.	0	100% dead at 70 d.	70 d.
Tauber and Hughes, 1950	Rats	Wistar-Ames	F	100 - 600 p.p.m. in the diet	P.O.	0[279a]	----	60 d.

[278] Only testis and comb examined.
[279] No pathological report.
[279a] No full pathological report.

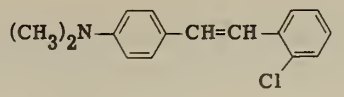
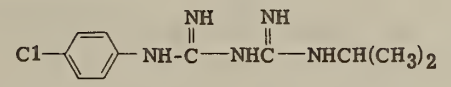
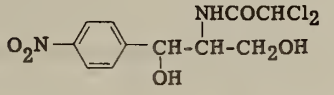
Reference	Animal	Strain or type	Sex	Preparation and dose	Site and route	Animals with tumors	Survival	Duration of experiment
296.--2, 2-BIS(p-CHLOROPHENYL)-1, 1, 1-TRICHLOROETHANE--Continued 								
Cameron and Cheng, 1951	Rats	Albino	M&F	0.36 mg. per kg. in arachis oil	P.O.	0	6 alive	63 wks.
	Rats	Albino	M&F	36.0 mg. per kg. in arachis oil	P.O.	0	5 alive	43 wks.
	Rats	Albino	M&F	3.6 mg. per kg. in arachis oil	P.O.	0	8 alive	43 wks.
	Rats	Albino	M&F	0.36 mg. per kg. in arachis oil	P.O.	0	6 alive	43 wks.
	Rats	Albino	M&F	3.6 mg. per kg. in arachis oil	P.O.	0	6 alive	63 wks.
	Rats	Albino	M&F	36.0 mg. per kg. in arachis oil	P.O.	0	6 alive	63 wks.
	Rats	Albino	M&F	36.0 mg. per kg. in arachis oil	P.O.	0	6 alive	63 wks.
	Rats	Albino	M&F	0.36 - 3.6 mg. per kg. in arachis oil	P.O.	0	12 alive	33 wks.
297.--2, 6-BIS(4-HYDROXY-2-METHYL-5-ISOPROPOXYBENZOYL) p-CRESOL 								
Nagata and Kojima, 1952	4 mice	----	M&F	0.01 - 0.05% in margarine in the diet	P.O.	0[279]	"High death rate"	45 d.
298.--2, 2-BIS(p-METHOXYPHENYL)-1, 1, 1-TRICHLOROETHANE 								
Haag et al., 1950	2 dogs	----	----	0.43 mg. per liter air, 2 hrs. per day, 5 days per wk.	Inhalation	0	100% survival	5 wks.
	10 rats	Albino	----	0.43 mg. per liter air, 2 hrs. per day, 5 days per wk.	Inhalation	0	4 died	5 wks.
	49 rats	Albino	M	300 - 10,000 p.p.m. in the diet	P.O.	Tumor[280]	23 alive at 52 wks.	1 yr.
	15 rabbits	Albino	----	30% soln. in dimethyl phtalate daily, 5 d. per wk. (0.25, 3.0 ml. per kg.)	Skin	0	1 died	13 wks.
Hodge et al., 1950a	80 rats	----	M&F	0.01 - 1.0% in the diet	P.O.	0	16 died during experiment	45 d.
Hodge et al., 1952b	75 rats	----	M&F	0.0025 - 0.16% in the diet	P.O.	Tumors[281]	4-30% in 1st yr.	2 yrs.
	6 dogs	----	M&F	20 - 300 mg. per kg. per d.	P.O.	0	2 died	1 yr.

[279] No pathological report.
[280] 1 lymposarcoma, ulcerated.
[281] Various tumors found but thought spontaneous (e.g. mammary, ovary, abdominal wall, pancreas, neurofibroma and epidermoid carcinoma). Controls had no tumors.

Reference	Animal	Strain or type	Sex	Preparation and dose	Site and route	Animals with tumors	Survival	Duration of experiment
299. --BIS(p-TOLUENESULPHONOXYETHYL)ANILINE 								
Boyland and Sargent, 1951	12 mice	Stock	----	20 mg. per ml. in arachis oil, 0.05 ml. of soln. in 1, 2 or 4 sites	Intradermal	0	----	----
300. --BRILLIANT BLUE[282] 								
Willheim and Ivy, 1953	10 rats	Wistar	M&F	4% of the diet	P.O.	0	----	2 yrs.
301. --2-sec.-BUTYL-4, 6-DINITROPHENOL 								
Spencer et al., 1948	60 rats	Dow and B & L	M	0.005, 0.01 or 0.02% in the diet	P.O	0	----	189 d.
302. --N-sec.-BUTYL PHTHALIMIDE 								
Draize et al., 1948	40 rats	----	----	Undiluted, daily	Skin	0	----	90 d.
	70 mice	----	----	Undiluted, daily	Skin	0	----	90 d.
	40 guinea pigs	----	----	Undiluted, daily	Skin	0	----	90 d.
	60 rabbits	----	----	Undiluted, daily	Skin	0	----	90 d.
303. --CAROTENE[282a] 								
Frazer, 1949	2 mice	----	----	2500 I.U. every other day for 10 wks.	P.O.	0	----	At least 10 wks.

[282] FD&C Blue 1.

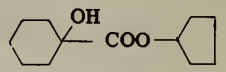
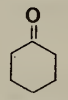
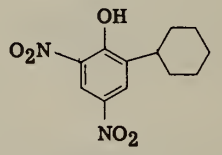
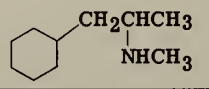
[282a] Isomer not stated. Formula for α- and β- carotene given.

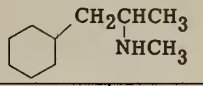
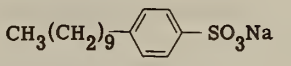
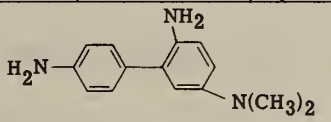
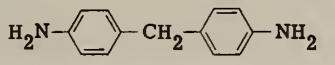
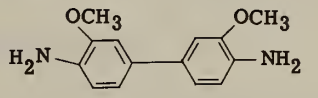
Reference	Animal	Strain or type	Sex	Preparation and dose	Site and route	Animals with tumors	Survival	Duration of experiment
304.--2'-CHLORO-4-DIMETHYLAMINOSTILBENE 								
Boyland and Sargent, 1951	10 mice	CBA	----	12.5 mg. per ml. in arachis oil, 0.05 ml. of soln. in 40 sites	Intradermal	0	----	----
Elson, 1952	20 rats	Albino	M&F	In arachis oil, total of 60 mg. in 5 doses over a 2 mos. period, 20% protein diet	I.P.	Tumors[283]	----	At least 589 d.
	20 rats	Albino	M&F	In arachis oil, total of 60 mg. in 5 doses over a 2 mos. period, 5% protein diet	I.P.	Tumors[284]	----	At least 610 d.
	20 rats	Albino	M	In arachis oil, total of 60 mg. in 5 doses over a 2 mos. period, 5% protein and methionine diet	I.P.	Tumors[285]	----	At least 622 d.
305.--CHLOROGUANIDE 								
Schmidt et al., 1953b	30 rats	----	----	0.025, 0.05, 0.1% in the diet	P.O.	0	6 deaths in 12 rats on 0.1%	6 wks.
306.--CHLOROMYCETIN 								
Roine et al., 1953	10 guinea pigs	----	----	50 mg. per kg. in diet	P.O.	0	All alive	6 wks.
307.--CYCLOHEXANE								
Fabre et al., 1952	3 rabbits	----	----	10 cc. for 30 d., twice daily with a 15 minute interval	Skin	0	----	30 d.
	12 rats	----	----	8 or 18 mg. per liter, 8 hrs. per d., 6 d. per wk. for 40 d.	Inhalation	0	----	40 d.
	16 rabbits	----	----	2 - 22 mg. per liter, 8 hrs. per d., 6 d. per wk. for 40 d.	Inhalation	0	----	40 d.

[283] 2 cholangiomas, 2 lung adenoma and carcinoma, 6 mammary carcinoma, pituitary chromophobe adenoma, 1 intestine squamous cell carcinoma, 1 uterine fibroma or carcinoma, 1 thymus lymphangioma, 1 neck carcinoma, 1 groin carcinoma, 1 submaxillary gland carcinoma.

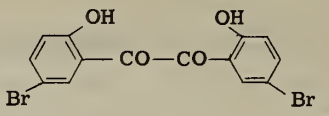
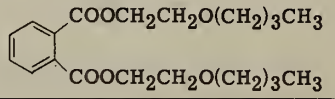
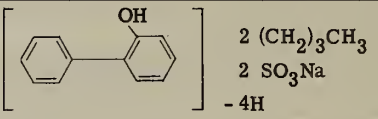
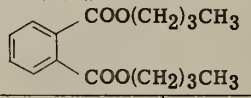
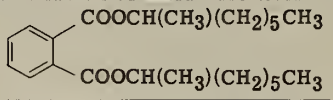
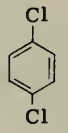
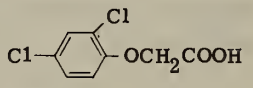
[284] 1 cholangioma, 1 hepatoma, 2 hypernephromas, 2 mammary carcinomas, 1 stomach carcinoma, 1 uterine fibroma or carcinoma, 1 ear duct carcinoma.

[285] 2 lung adenomas and carcinomas, 1 stomach carcinoma.

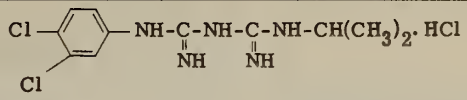
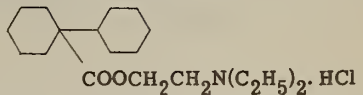
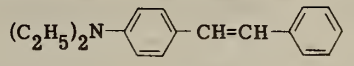
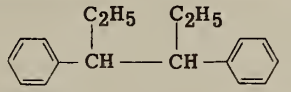
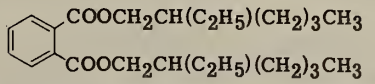
Reference	Animal	Strain or type	Sex	Preparation and dose	Site and route	Animals with tumors	Survival	Duration of experiment
308.--CYCLOHEXANOL CARBOXYLIC ACID, CYCLOPENTYL ESTER 								
Draize et al., 1948	80 mice	----	----	Undiluted, daily	Skin	0	----	90 d.
	60 rats	----	----	Undiluted, daily	Skin	0	----	90 d.
309.--CYCLOHEXANONE 								
Ceresa and Grazioli, 1951	6 guinea pigs	----	----	Increasing doses, 10 mg. daily for 20 d., 50 mg. daily for 40 d. and 100 mg. daily for 20 to 40 d.	S.C.	0	----	100 d.
310.--CYCLOHEXYL ACETOACETATE CH_3COCH_2COO								
Draize et al., 1948	70 mice	----	----	Undiluted, daily	Skin	0	----	90 d.
311.--CYCLOHEXYL AZELATE $(CH_2)_7(COO$ $)_2$								
Mallette and von Hamm, 1952	6 rats	----	----	6 gm. per kg. minimum dosage	I.P.	0	----	1 mo.
312.--2-CYCLOHEXYL-4, 6-DINITROPHENOL 								
Spencer et al., 1948	Rabbits	White	----	5% in olive oil	Skin	0	----	4 wks.
	60 rats	Dow and B & L	M	0.02, 0.05 or 0.10% in the diet	P.O.	0	----	195 d.
	10 ducks	Pekin	----	0.1% in the diet	P.O.	0	1 survived	38 d.
313.--dl-1-CYCLOHEXYL-2-METHYLAMINOPROPANE 								
Fellows et al., 1950b	15 rabbits	----	----	30 mg. per kg. daily	I.P.	0	----	30 d.
	15 guinea pigs	----	----	30 mg. per kg. daily	I.P.	0	----	30 d.

Reference	Animal	Strain or type	Sex	Preparation and dose	Site and route	Animals with tumors	Survival	Duration of experiment
313.--dl-1-CYCLOHEXYL-2-METHYLAMINOPROPANE--Continued 								
Fellows et al., 1950b	15 rats	----	----	25 mg. per kg. daily	I.P.	0	----	30 d.
	20 rats	----	----	0.55, 0.70 mg. per 800 ml. air, 60 minutes daily	Inhalation	0[286]	----	30 d.
314.--DECYLBENZENE SODIUM SULFONATE 								
Hopper et al., 1949	10 mice	Harlan	M&F	0.210 gm. per kg. daily, 6 d. per wk.	P.O.	0	1 died	30 d.
315.--2, 4'-DIAMINO-5-DIMETHYLAMINODIPHENYL 								
Miller and Miller, 1948	6 rats	Sprague-Dawley	M	0.176% in the diet for 4 mos.	P.O.	0	----	9 mos.
Miller et al., 1949	14 rats	Albino	M	5.34 m.mols per kg. in the diet for 10 mos.	P.O.	0	11 alive at 12 mos.	12 mos.
316.--4, 4'-DIAMINODIPHENYLMETHANE 								
Zylberszac, 1951	Rats	White and black	M	75 mg. implants (10 in 5 mos.)	S.C.	0[287]	----	5 mos.
	Rats	White and black	M	25 mg. implants (7 in 5 mos.)	S.C.	0[287]	----	5 mos.
317.--DIANISIDINE 								
Gehrmann et al., 1949	3 dogs	----	----	291 mg. daily	P.O.	0	----	3.5 yrs.
318.--N, N-DIBENZYL-β-CHLOROETHYLAMINE $(C_6H_5CH_2)_2NCH_2CH_2Cl$								
Wang and Nickerson, 1949	5 dogs	----	F	20 mg. per kg. once weekly for 6 wks.	I.V.	0[287a]	100% survival	6 wks.

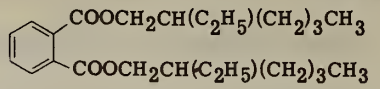
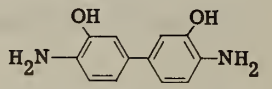
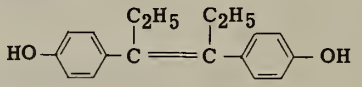
[286] Only lungs and bronchial tree examined pathologically.
[287] Liver cirrhosis.
[287a] No pathological investigations.

Reference	Animal	Strain or Type	Sex	Preparation and dose	Site and route	Animals with tumors	Survival	Duration of experiment
319.--5, 5'-DIBROMO-2, 2'-DIHYDROXYBENZIL 								
Quadbeck, 1949	3 rabbits	----	----	0.5 g. in milk daily	P.O.[23]	0[288]	----	3 mos.
320.--DIBUTOXYETHYL PHTHALATE 								
Mallette and von Hamm, 1952	6 rats	----	----	6 gm. per kg. minimum dose	I.P.	0	----	1 mo.
321.--DIBUTYLPHENYL-PHENOL SODIUM DISULFONATE[289] 								
Hopper et al., 1949	10 mice	Harlan	M&F	0.22 gm. per kg. daily, 6 d. per wk.	P.O.	0	1 died	30 d.
322.--DIBUTYL PHTHALATE 								
Smith, 1953	40 rats	Sprague-Dawley	M	0.01 - 1.25% in the diet	P.O.	0	50% survived	1 yr.
323.--DICAPRYL PHTHALATE 								
Mallette and von Hamm, 1952	6 rats	----	----	6 gm. per kg. minimum dose	I.P.	0	----	1 mo.
324.--p-DICHLOROBENZENE 								
Zupko and Edwards, 1949	18 rabbits	----	M	100 mg. per liter daily, 30 minute exposures for 31 d.	Inhalation	0	12 died	Over 31 d.
325.--2, 4-DICHLOROPHENOXYACETIC ACID 								
Drill and Hiratzka, 1953	11 dogs	Mongrel	M&F	2, 5, 10 or 20 mg. per kg. in capsules, 5d. per wk.	P.O.	0	8 lived	13 wks.

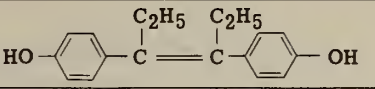
[23] Stomach tube.
[288] Mild degenerative changes in liver and kidney.
[289] Trade name: Arasklene 400.

Reference	Animal	Strain or type	Sex	Preparation and dose	Site and route	Animals with tumors	Survival	Duration of experiment
326.--N'-3, 4-DICHLOROPHENYL-N^5-ISOPROPYL DIGUANIDE HYDROCHLORIDE 								
Curd et al., 1950	1 monkey	Rhesus	M	5 mg. per kg. twice daily, 80 doses	P.O.	0	----	7 wks.
	1 monkey	Rhesus	F	10 mg. per kg. twice daily, 45 doses	P.O.	0	----	30 d.
	1 monkey	Mona	M	5 mg. per kg. twice daily, 12 doses, 10 mg. per kg., 20 doses, 15 mg. per kg., 4 doses	P.O.	0	----	33 d.
327.--β-DIETHYLAMINOETHYL 1-CYCLOHEXYLCYCLOHEXANECARBOXYLATE HYDROCHLORIDE [290] 								
Brown et al., 1950	1 monkey	Macaca Mulatta	F	4 mg. per kg. 3 times daily, 6 d. per wk. for 8 wks.	P.O.[23]	0	----	8 wks.
	24 rats	----	M&F	15 - 20 mg. per kg. daily for 40 d. then 10 mg. per kg. 2 times daily for 130 d.	P.O.[23]	0	1 died	170 wks.
	40 rats	----	M&F	20 - 500 mg. per kg. daily single doses, 6 d. per wk. for 8 wks.	P.O.[23]	0	3 died	8 wks.
	10 dogs	Mongrel	M&F	4 - 10 mg. per kg. in gelatin capsules, 3 times daily, 6 d. per wk. for 8 wks.	P.O.	0	100% survived	8 wks.
328.--4-DIETHYLAMINOSTILBENE 								
Haddow et al., 1948	12 rats	Albino	----	8 x 5 mg. in arachis oil weekly	S.C.	2 sarc.[291a]	All alive at 448 d.	538 d.
329.--DIETHYLDIHYDROSTILBENE 								
Li Voti and Mutolo, 1948	6 dogs[291]	----	M	1 mg. per kg. body wt. daily for 1 mo.	I.M.	0	----	1 mo.
330.--DI-(2-ETHYLHEXYL) PHTHALATE 								
Carpenter et al., 1953	1 dog	Mongrel	----	Gelatin capsule, 0.06 ml. per kg. per day for 77 doses and then 0.09 mg. per kg. per d. for 169 doses	P.O.	0	----	1 yr.

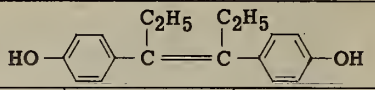
[23] Stomach tube.
[290] Trade name: Bentyl hydrochloride.
[291] 4 orchiectomized 1 week before treatment.
[291a] Also 2 carcinomas of acoustic duct, 1 carcinoma, and 1 lung adenoma.

Reference	Animal	Strain or type	Sex	Preparation and dose	Site and route	Animals with tumors	Survival	Duration of experiment
330.--DI-(2-ETHYLHEXYL) PHTHALATE--Continued 								
Carpenter et al., 1953	4 dogs	Cocker Spaniel and Wire-haired terrier	M&F	Gelatin capsule, 0.03 ml. per kg. per d., 5 d. per wk. for 19 doses, and then 0.06 ml. per d. for 240 doses	P.O.	0	----	1 yr.
	93 guinea pigs	Hybrid	M&F	0.13 and 0.04% in the diet	P.O.	0[292]	23% died	366 d.
	192 rats	Sherman	M&F	0.4 - 0.04% in the diet	P.O.	0[293]	64.4% died	2 yrs.[294]
331.--3, 3'-DIHYDROXYBENZIDINE 								
Boyland and Sargent, 1951	10 mice	B	----	35 mg. per ml. in water, 0.05 ml. of soln. in 40 sites	Intradermal	0	----	----
	35 mice	Stock	----	10 mg. per ml. in arachis oil, 0.05 ml. of soln. in 140 sites	Intradermal	0	----	At least 78 d.
Baker, 1953	12 rats	Slonaker	M	0.125% in 10 - 15 gm. diet daily, total dose 5 - 8 gm.	P.O.	Tumors[295]	7 alive at 30 wks.	41 wks.
332.--4, 4'-DIHYDROXY-α,β-DIETHYLSTILBENE 								
Dunning et al., 1947	60 rats	Fischer	M&F	15 - 25 mg. crystalline	S.C.	Tumors[296]	----	At least 136 d.
	60 rats	AXC	M&F	15 - 25 mg. crystalline	S.C.	0	----	At least 186 d.
	60 rats	Copenhagen	M&F	15 - 25 mg. crystalline	S.C.	1 pap.[297]	----	At least 298 d.
	60 rats	Fischer	M&F	15 - 75% cholesterol pellet	S.C.	Tumors[298]	----	At least 367 d.
	60 rats	AXC	M&F	15 mg. in 75% cholesterol	S.C.	Tumors[299]	----	At least 442 d.
	60 rats	Copenhagen	M&F	5 - 15 mg. in 75% cholesterol	S.C.	Tumors[300]	----	At least 528 d.

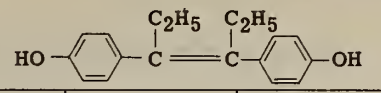
[292] Lung tumor in one control animal
[293] 9 rats with "neoplasm". No pathological description. (Control group had 5 neoplasms).
[294] Also 1 year study of 80 F_1 generation.
[295] 7 hepatomas, 6 adenocarcinomas of colon, 2 carcinomas of forestomach, 3 bladder carcinomas, 3 sebaceous gland tumors.
[296] Pituitary adenomas in all rats.
[297] Of bladder.
[298] 5 mammary carcinomas.
[299] 39 rats with 128 mammary carcinomas, 3 rats with bladder carcinoma.
[300] 22 carcinomas of the bladder.

Reference	Animal	Strain or type	Sex	Preparation and dose	Site and route	Animals with tumors	Survival	Duration of experiment
332.--4, 4'-DIHYDROXY-α,β-DIETHYLSTILBENE--Continued 								
Mulligan and Becker, 1947	4 dogs	Mongrel	M	770 - 3520 mg. total dose	P.O.	0	----	At least 208 d.
Abramson and Warshawsky, 1948	1 human	----	M	1 mg. 4 times daily, average (total of 1097 mg. in 489 d.)	P.O.	Tumors[301]	----	489 d.
Bruzzone et al., 1948	Guinea pigs[301a]	----	----	Pellet with 40% cholesterol	S.C.	Tumors[301b]	----	186 d.
	Guinea pigs	----	F	Pellet with 40% cholesterol (Also metallic pellet in right thoracic cavity)	S.C.	Tumors[301c]	Autopsy 157 173 d.	173 d.
Dunning et al., 1948b	17 rats	Fischer	F	15 - 25 mg. crystalline	S.C.	0	----	140 d.
	26 rats	Fischer	M	15 - 25 mg. crystalline	S.C.	0[302]	----	Over 200 d.
	30 rats	AXC	M	15 - 25 mg. crystalline	S.C.	0[303]	----	240 d.
	29 rats	AXC	F	15 - 25 mg. crystalline	S.C.	0[304]	----	432 d.
	25 rats	Copenhagen	M	15 - 25 mg. crystalline	S.C.	0[305]	----	432 d.
	21 rats	Copenhagen	F	15 - 25 mg. crystalline	S.C.	0[306]	----	432 d.
	23 rats	August	M	15 - 25 mg. crystalline	S.C.	0[307]	----	At least 234 d.
	13 rats	August	F	15 - 25 mg. crystalline	S.C.	0[308]	----	At least 118 d.
	30 rats	Fischer	M	4 - 15 mg. in a 75% cholesterol pellet	S.C.	Tumors[309]	----	Over 570 d.
	22 rats	Fischer	F	4 - 15 mg. in a 75% cholesterol pellet	S.C.	Tumors[310]	----	Over 400 d.
	29 rats	AXC	M	4 - 15 mg. in a 75% cholesterol pellet	S.C.	Tumors[311]	----	Over 800 d.
	29 rats	AXC	F	4 - 15 mg. in a 75% cholesterol pellet	S.C.	Tumors[312]	----	Over 750 d.
	30 rats	Copenhagen	M	4 - 15 mg. in a 75% cholesterol pellet	S.C.	Tumors[313]	----	Over 768 d.
	28 rats	Copenhagen	F	4 - 15 mg. in 75% cholesterol pellet	S.C.	Tumors[314]	----	Over 768 d.
	22 rats	August	F	4 - 15 mg. in a 75% cholesterol pellet	S.C.	Tumors[315]	----	At least 317 d.
	34 rats	August	M	4 - 15 mg. in a 75% cholesterol pellet	S.C.	Tumors[316]	----	At least 456 d.

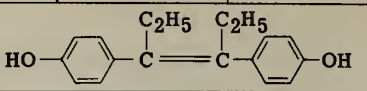
[301] Mammary carcinoma in man with prostate cancer.
[301a] Part of diaphragm excised.
[301b] 100%. Abdominal fibroids and in some also thoracic.
[301c] Abdominal fibroids.
[302] 1 mammary gland hyperplasia.
[303] 2 bladder calculi.
[304] 13 with mammary gland hyperplasia.
[305] 16 with bladder calculi.
[306] 2 with mammary gland hyperplasia, 1 with a bladder calculus.
[307] 9 with mammary hyperplasia (probably early cancer), 4 with bladder calculi.
[308] 2 mammary gland hyperplasia (probably early cancer), and 10 with bladder calculi.
[309] 5 mammary carcinoma.
[310] 1 mammary carcinoma, 3 with bladder calculi.
[311] 17 rats with 39 mammary carcinoma, 2 rats with bladder carcinoma and 6 rats with bladder calculi.
[312] 22 rats with 89 mammary carcinoma, 1 rat with bladder carcinoma, 1 rat with bladder calculus and 1 rat with adrenal carcinoma.
[313] 16 with bladder carcinoma, 22 with bladder calculi.
[314] 6 with bladder carcinoma, 8 with bladder calculi.
[315] 7 rats with 15 mammary carcinoma, 4 rats with bladder carcinoma and 9 rats with bladder calculi.
[316] 23 rats with 80 mammary carcinoma, 2 rats with bladder carcinoma and 5 rats with bladder calculi.

Reference	Animal	Strain or type	Sex	Preparation and dose	Site and route	Animals with tumors	Survival	Duration of experiment
332.--4, 4'-DIHYDROXY-α,β-DIETHYLSTILBENE--Continued 								
Gangitano, 1948	50 rats	----	F	0.4 mg. every other day	S.C.	0	----	240 d.
Bielschowsky, 1949b	30 rats	Wistar and Piebald	M	Pellets	S.C.	Tumors[317]	----	Over 48 wks.
Bruzzone, 1949	15 guinea pigs	----	F, castr.	40% pellet with cholesterol (total absorbed per day 6 - 20 μg.)	S.C.	Tumors[318]	----	90 d.
de Pasqualini and Bur, 1949	4 guinea pigs	----	F, castr.	1 mg. per body wt. per d., 6 d. per wk., in tablet form (total of 72 - 84 mg.)	P.O.	Tumors[319]	----	98 d.
	4 guinea pigs	----	M, castr.	1 mg. per body wt. per d., 6 d. per wk. in tablet form (total of 140 mg.)	P.O.	Tumors[320]	----	162 d.
Dunning et al., 1949b, 1949c	84 rats[327]	A x C	F	Cholesterol pellet containing 4 - 6 mg.	S.C.	58[322]	67 alive at 180 d.	At least 180 d.
Howard and Grosjean, 1949	1 human[328]	----	M	5 to 120 mg. daily tablets (total dosage 40,280 mg.)	P.O..	1[329]	----	5 yrs.
Kaufmann et al., 1949	65 mice	BI-H	F	0.3% in sesame oil, 150 μg. weekly (0.05 ml.)	S.C.	0[330]	----	23 mos.
	44 mice	BI-H	M	0.3% in sesame oil, 150 μg. weekly (0.05 ml.)	S.C.	22[331]	----	23 mos.
	67 mice	BI-H	M	0.3% in chloroform weekly (1 per 40 ml.)	Skin	0	----	11 mos.
	80 mice	BI-H	F	0.3% in chloroform weekly (ca. 1 per 40 ml.)	Skin	1[332]	----	11 mos.
	67 mice	BI-C	F	0.3% in sesame oil, 150 μg. weekly (0.05 ml.)	S.C.	3	----	----
	74 mice	BI-C	M	0.3% in sesame oil, 150 μg. weekly (0.05 ml.)	S.C.	1	----	----
King et al., 1949	15 mice[333]	C3H	F	0.5 μg. per day in the diet	P.O.	15[334]	----	At least 7.6 mos.
	8 mice	C3H	F	0.5 μg. per day in the diet (restricted diet)	P.O.	8[334]	----	At least 13.4 mos.
Kirkman and Bacon, 1949	24 hamsters	Golden	M	0.6 mg. microcrystals in saline on alternate days for 90 to 160 d.	S.C.	0	----	At least 160 d.
	12 hamsters	Golden	M	0.6 mg. as microcrystals in saline for 320 to 496 days on alternate days	S.C.	12[335]	----	At least 496 d.
Krohn, 1949	3 monkeys	Macaca Mulatta	F	10 μg. daily in arachis oil (total 7.534 - 4.8191 mg.)	I.M.	0	----	1198 d.

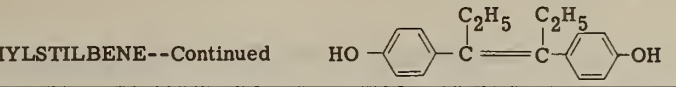
[317] 4 mammary carcinomas between the 34th and 48th week in the 10 Wistar rats, and 1 in the 20 Piebald rats.
[318] Uterine fibromyomas.
[319] Fibromyomas at operative site and in abdominal cavity.
[320] 100% fibromyomas in abdominal cavity, thoracic cavity and at operative site.
[322] Mammary carcinomas.
[327] Various diets.
[328] With prostate carcinoma.
[329] Bilateral carcinoma of breast
[330] Mammary 46% (46% in the controls).
[331] Mammary 50% (controls 0)
[332] Mammary 1.3%.
[333] Ovariectomized.
[334] Mammary tumors.
[335] 7 renal adenomas, 5 renal adenocarcinomas.

Reference	Animal	Strain or type	Sex	Preparation and dose	Site and route	Animals with tumors	Survival	Duration of experiment
332.--4, 4'-DIHYDROXY-α,β-DIETHYLSTILBENE--Continued 								
Meyer, 1949	24 rats	Wistar	M	80 and 200 gamma in 0.1 cc. sesame oil every 48 hrs.	S.C.	0	----	176 d.
	18 rats	Wistar	M	80 and 200 gamma in 0.1 cc. sesame oil every 48 hrs.	S.C.	0	----	154 d.
	18 rats	Wistar	M	80 and 200 gamma in 0.1 cc. sesame oil every 48 hrs.	S.C.	0	----	140 d.
	12 rats	Wistar	M	80 and 200 gamma in 0.1 cc. sesame oil every 48 hrs.	S.C.	0	----	120 d.
Murphy and Sturm, 1949	116 mice	R.I.L.	M	0.05 mg. in oil weekly for 7 mos.	I.M.	Tumors[336]	----	At least 44 wks.
Nadel, 1949	20 guinea pigs[337]	Family 13	F	Pellets with cholesterol (1:1) containing 7.5 to 50 mg. stilbestrol	S.C.	15[337a]	----	96 d.
Andervont, 1950b	29 mice	CxC3H	F	5% in cholesterol, 2 mg. pellets [338a]	S.C.	9[338]	----	25 mos.
	18 mice	C	F	5% in cholesterol, 2 mg. pellets[338b]	S.C.	1[338]	----	27 mos.
	15 mice	C	F	2% in cholesterol, 2 mg. pellets[338b]	S.C.	1[338]	----	26 mos.
	23 mice	CxC3H	F	10% in cholesterol, 2 mg. pellets[338a]	S.C.	7[338]	----	25 mos.
	22 mice	CxC3H	F	2% in cholesterol, 2 mg. pellets[338a]	S.C.	12[338]	----	25 mos.
	15 mice	C	F	10% in cholesterol, 2 mg. pellets[338b]	S.C.	1[338]	----	26 mos.
	23 mice	CxC3H	F	10% in cholesterol, 2 mg. pellets[338b]	S.C.	9[338]	----	24 mos.
Cardeza, 1950	Rats[339]	----	----	Daily inj. for 6 mos.	----	Tumors[340]	----	6 mos.
Corbett and Abrams, 1950	Human	----	M	1 mg. 1 - 3 times daily for 3 yrs. (total 3240 mg.)	P.O.	Tumors[341]	----	3 yrs.
Dunning et al., 1950a	Rats	A x C	F	Pellets	S.C.	Tumors[342]	----	----
Dunning et al., 1950b	39 rats	A x C, line 9935	F	Cholesterol pellets with 4 - 6 mg. (various diets used)	S.C.	Tumors[343]	All survived at 163 d.	500 d.
Kar and Ghosh, 1950	10 fowls	White leghorn	M	0.3 mg. in 0.1 cc. sesame oil daily for 34 d.	I.M.	0	----	34 d.
Kirkman and Bacon, 1950	Hamsters	----	M	Pellets with cholesterol (75%)	S.C.	0	----	----
	Hamsters	----	M	20 mg. pellets	S.C.	6[344]	----	300 d.
	Hamsters	----	M	0.6 mg. microcrystals in 0.2 cc. saline or sesame oil every other day for up to 270 d.	S.C.	12[345]	----	497 d.

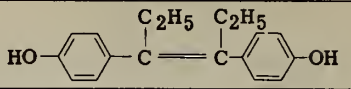
[336] 71.5% with leukemia (untreated controls have 41.5%).
[337] 16 oophorectomized.
[337a] Fibromyomas.
[338] Mammary.
[338a] In C mothers. Pellets removed after 1 month.
[338b] Pellets removed after 1 month.
[339] Castrated and 95% of the pancreas removed.
[340] Tumors of the pancreas. No details.
[341] Bilateral carcinoma of breast (man with prostatic carcinoma).
[342] 161 gross mammary carcinomas.
[343] 30 rats developed a total of 161 macroscopic mammary carcinomas.
[344] Renal tumors in all surviving 250 days.
[345] Renal tumors.

Reference	Animal	Strain or type	Sex	Preparation and dose	Site and route	Animals with tumors	Survival	Duration of experiment
332.--4, 4'-DIHYDROXY-α,β-DIETHYLSTILBENE--Continued 								
Maisin and Meersseman, 1950	26 rats	----	M	15 mg. pellet	Implantation	15[346]	----	18 mos.
	24 rats	----	F	15 mg. pellet	Implantation	12[346]	----	15 mos.
Stamler et al., 1950c	10 fowls	Hyline	M	25 mg. pellets at 3 wk. intervals	S.C.	0[347]	----	27 wks.
Stamler et al., 1950b	20 fowls	Hyline	M	25 mg. pellets at 3 wk. intervals	S.C.	0[347]	----	35 wks.
Trentin, 1950	68 mice	C3H, CBA F x A M F_1 hybrids	M	6 - 8 pellet (24% stibestrol, 75% cholesterol)	S.C.	Tumors[348]	15 alive at 15.5 mos.	15.5 mos.
Benko et al., 1951	22 mice	----	M&F	2.5 per thousand dissolved in oil soln., every other day for 144 d.	Skin	0	----	At least 144 d.
	2 mice	----	M&F	2.5 per thousand dissolved in oil soln., daily for 100 d.	Skin	0	----	At least 100 d.
Dunning et al., 1951	Rats	A x C	M	4 - 10 mg. in cholesterol pellets (average dose 7.4 mg.)	S.C.	Tumors[349]	26 alive at 180 d.	700 d.
	Rats	A x C	F	4 - 10 mg. in cholesterol pellets (average dose 5.4 mg.)	S.C.	Tumors[350]	29 alive at 180 d.	700 d.
	30 rats	Copenhagen	M	4 - 10 mg. in cholesterol pellets (average dose 8.6 mg.)	S.C.	Tumors[351]	----	800 d.
	27 rats	Copenhagen	F	4 - 10 mg. in cholesterol pellets (average dose 9.0 mg.)	S.C.	Tumors[352]	----	518 d.
	30 rats	XC(A x C)	F	4 - 10 mg. in cholesterol pellets (average dose 5.4 mg.)	S.C.	Tumors[352a]	----	548 d.
	28 rats	(A x C) x C	M	4 - 10 mg. in cholesterol pellets (average dose 6.2 mg.)	S.C.	Tumors[353]	----	800 d.
	23 rats	(A x C) x C	F	4 - 10 mg. in cholesterol pellets (average dose 3.8 mg.)	S.C.	Tumors[354]	----	800 d.
	31 rats	Copenhagen x (A x C)	M	4 - 10 mg. in cholesterol pellets (average dose 5.6 mg.)	S.C.	Tumors[355]	----	550 d.
Meersseman and Maisin, 1951	50 rats	Semi-inbred[356]	M&F	15 mg. in a pellet with cholesterol	S.C.	Tumors[357]	34 alive at 300 d.	500 d.

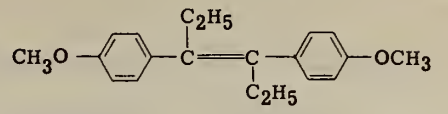
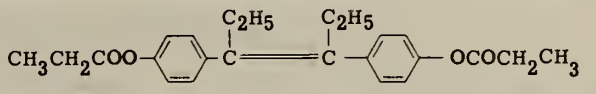
[346] Pituitary adenomas.
[347] Atherosclerosis induced.
[348] Mammary. No details.
[349] 17 mammary carcinomas, 2 bladder tumors.
[350] 22 mammary tumors, 1 bladder tumor (other scattered neoplasms, adrenal, ovary, uterus and thymus noted.
[351] 17 bladder papillomas and carcinomas, also leukemias.
[352] 6 bladder papillomas and carcinomas and 1 fibromyoma of uterus.
[352a] 9 mammary carcinomas.
[353] 6 mammary carcinomas, 7 bladder tumors, also a thymoma and a malignant melanoma of the ear.
[354] 8 mammary carcinomas, 1 bladder tumor.
[355] 11 mammary carcinomas, 2 bladder carcinomas.
[356] Inbred by authors in their laboratory for 10 years.
[357] 27 with pituitary adenomas.

Reference	Animal	Strain or type	Sex	Preparation and dose	Site or route	Animals with tumors	Survival	Duration of experiment
332. --4, 4'-DIHYDROXY-α,β-DIETHYLSTILBENE--Continued 								
Acevedo and Migone, 1952	Cats	----	M&F	In oil soln., 2 mg. per kg. during 4 or 5 d. (after total pancreatectomy)	I.M.	0	----	Over 30 d.
Bacon, 1952	80 hamsters	----	M&F	Pellets	S.C.	Tumors[358]	----	----
Dunning and Curtis, 1952	Rats	August	M&F	Cholesterol pellets containing 4 - 15 mg. (10.1 mg. average dose)	S.C.	Tumors[359]	73 alive at 150 d.	459 d.
	Rats	Copenhagen	M&F	Cholesterol pellets containing 4 - 15 mg. (8.8 mg. average dose)	S.C.	Tumors[360]	57 alive at 150 d.	528 d.
	Rats	August x Copenhagen	M&F	Cholesterol pellets containing 4 - 15 mg. (7.3 mg. average dose)	S.C.	Tumors[361]	76 alive at 150 d.	557 d.
	Rats	A x C	M&F	Cholesterol pellets containing 4 - 15 mg. (5.7 mg. average dose)	S.C.	Tumors[362]	73 alive at 150 d.	442 d.
	Rats	Copenhagen x August	M&F	Cholesterol pellets containing 4 - 15 mg. (5.1 mg. average dose)	S.C.	Tumors[363]	56 alive at 150 d.	537 d.
Eser, 1952	12 rats	Swiss	F	Large doses for 10.5 mos.	----	Tumors[364]	----	At least 10.5 mos.
Horning, 1952	Mice	A, C3H	M	Powder and prostate tissue graft	S.C.	0	----	6 wks.
Jakobsen, 1952	1 human	----	M	15 mg. per day for 18 mos. (total dose 8000 mg.)	P.O.	1[365]	----	----
Janes and Bradbury, 1952	35 rats	Long Evans	F	Daily inj. of 100 μg. or 10 mg. pellet (95% diethylstilbestrol and 5% cholesterol) for 20 d.	S.C.	0[366]	----	At least 20 d.
	10 rats	Long Evans	F	Daily inj. of 100 μg. or 10 mg. pellet (95% diethylstilbestrol and 5% cholesterol) for 40 d.	S.C.	0	----	At least 40 d.
	39 rats[367]	Long Evans	F	Daily inj. of 100 μg. or 10 mg. pellet (95% diethylstilbestrol and 5% cholesterol) for 20 d.	S.C.	0[368]	----	At least 20 d.
	59 rats[367]	Long Evans	F	Daily inj. of 100 μg. or 10 mg. pellet (95% diethylstilbestrol and 5% cholesterol) for 20 d.	S.C.	0[369]	----	At least 20 d.
Kirkman and Bacon, 1952a	131 hamsters	----	M	0.6 mg. in sesame oil or saline every other day, or pellets once a day	S.C.	104[370]	----	985 d.

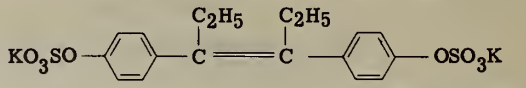
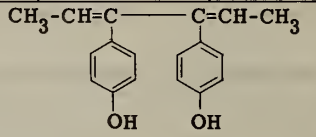
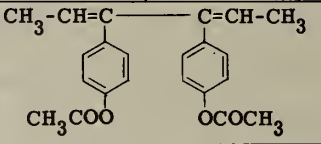
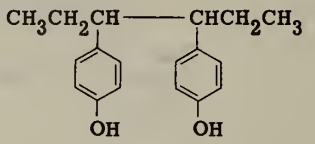
[358] Tumor nodules in the uterus.
[359] 58% mammary carcinomas, 11% bladder carcinomas, 22% adrenal tumors.
[360] 39% bladder carcinomas.
[361] 24% mammary carcinomas, 11% bladder carcinomas, 16% adrenal tumors.
[362] 64% mammary carcinomas, 50% bladder carcinomas, 4% adrenal tumors.
[363] 21% mammary carcinomas, 2% bladder carcinoma, 11% adrenal tumors.
[364] In 4 animals, hypertrophy of the hypophysis and hyperplasia of the chromophobic cells; 4 other animals had chromophobic adenomas.
[365] Bilateral carcinoma of the breast.
[366] 3 with ovarian cysts.
[367] Thyroidectomized.
[368] 7 with ovarian cysts.
[369] 32 ovarian cysts.
[370] Renal tumors, 45 with metastases.

Reference	Animal	Strain or type	Sex	Preparation and dose	Site or route	Animals with tumors	Survival	Duration of experiment
332.--4, 4'-DIHYDROXY-α,β-DIETHYLSTILBENE--Continued 								
Kirkman and Bacon, 1952b	8 hamsters	Golden	M	0.6 mg. in 0.2 cc. sesame oil every other day for 151 d., and then in 0.2 cc. of 0.9% NaCl for an average of 247 d.	S.C.	8[371]	----	398 d.
	3 hamsters	Golden	M	0.06 mg. in 0.2 cc. of 0.9% NaCl every other day.	S.C.	0	----	356 d.
	5 hamsters	Golden	M	0.6 mg. in 0.2 cc. of 0.9% NaCl every 10th day for 250 days or more	S.C.	0	----	405 d.
	53 hamsters	Golden	M	20 mg. pellets, mean daily absorption 0.09 mg.	S.C.	52[372]	----	376 d.
	11 hamsters	Golden	M	0.6 mg. in 0.2 cc. of 0.9% NaCl every day for 250 days or more	S.C.	11[373]	----	342 d.
	38 hamsters	Golden	M	0.6 mg. in 0.2 cc. of 0.9% NaCl every day for 101 days followed by pellet implanted for 278 days	S.C.	35[374]	----	379 d.
	8 hamsters	Golden	M	20 mg. pellets of stilbestrol and cholesterol in a ratio of 1:4	S.C.	0	----	344 d.
	11 hamsters	Golden	M	20 mg. pellets of stilbestrol and cholesterol 1:4 plus a 20 mg. pellet of pure stilbestrol	S.C.	4[375]	7 died early	400 d.
	Hamsters	Golden	M	Pellets, 31 mg. absorbed in 338 d.	S.C.	100%[376]	----	394 d.
Heston et al., 1953a	68 mice	$C3H_F$	M	5 - 8 mg. cholesterol pellet containing 10%	S.C.	Tumors[377]	----	2 yrs.
Huseby, 1953	30 mice	Hybrid	M	0.5 μg. per day in the diet	P.O.	11[378]	----	----
	20 mice	Hybrid	M, castr.	0.5 μg. per day in the diet	P.O.	19[379]	----	----
	37 mice	Hybrid	M	0.5 μg. per day in the diet	P.O.	12[378]	----	----
	34 mice	Hybrid	M, castr.	0.5 μg. per day in the diet	P.O.	33[379]	----	----
Stevenson and Ellis, 1953	13 pigs[379a]	----	F	0.025 - 50 mg. daily in the diet and in oil 5 mg. daily to 176 mg.	P.O. and I.M.	0	----	76 d.

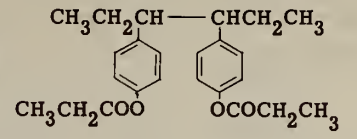
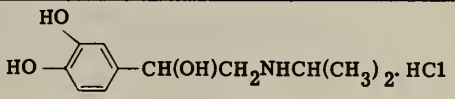
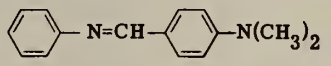
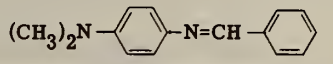
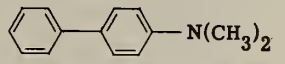
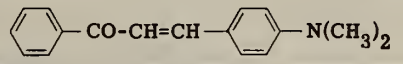
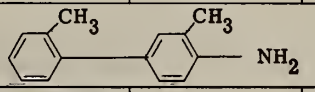
[371] Renal tumors, all with metastases.
[372] Renal tumors, 33 with metastases.
[373] Renal tumors, 2 with metastases.
[374] Renal tumors, 25% with metastases.
[375] Renal tumors, 2 with metastases.
[376] Renal carcinomas, 55% with metastases.
[377] 12 mammary carcinomas at average age of 15.1 months, 14 hepatomas at average age of 22.6 months, 5 pulmonary adenomas at average age of 19.4 months, 1 subcutaneous sarcoma at average age of 24 months, 1 tumor of Harderian gland at average age of 20 months
[378] Mammary.
[379] Mammary. Most castrates had pituitary nodules.
[379a] Study of reproductive capacity.

Reference	Animal	Strain or type	Sex	Preparation and dose	Site or route	Animals with tumors	Survival	Duration of experiment
333.--4, 4'-DIHYDROXY-α,β-DIETHYLSTILBENE DIMETHYL ETHER 								
Adams et al., 1950	12 fowls	White leghorn	F	0.01 or 0.02% of the diet	P.O.	0[380a]	----	12 wks.
334.--4, 4'-DIHYDROXY-α,β-DIETHYLSTILBENE DIPROPIONATE 								
dePasqualini and Bur, 1949	3 guinea pigs	----	F, castr.	25 mg. tablet implanted (total absorption 9, 6.2 and 2.5 mg.)	Implantation	Tumors[380]	All killed	91 d.
	4 guinea pigs	----	M, castr.	25 mg. tablet implanted (total absorption of 5.8, 9.5 and 6.8 and 9.5 mg.)	Implantation	Tumors[380]	All killed	123 d.
Prigozhina, 1949	103 rats	----	F, castr.	30% in 10 mg. wax pellets, once monthly for 4 - 6 mos.	S.C.	Tumors[381]	----	At least 10 mos.
Fels, 1950a	39 rats	----	----	10 - 54 mg. (total dose) 3 during 35 - 227 d.	Inj.	Tumors[382]	----	227 d.
Fels, 1950b	15 rats	----	----	0.25 - 1 mg. (in 0.05 - 0.1 ml. oil), 2 to 4 times per week (total dose 10 - 20 mg.)	S.C.	0	----	227 d.
	9 rats	----	----	20 - 30 mg. total dose (0.25 - 1 mg. in 0.05 - 0.1 ml. oil, 2 - 4 times per wk.	S.C.	1[383]	----	201 d.
Fels, 1950b	15 rats	----	----	Total dose 30 - 54 mg. (0.25 - 1 mg. in 0.05 - 0.1 ml. oil, 2 - 4 times per wk.)	S.C.	9[384]	----	134 d.
	30 rats	----	M&F normal and castr.	0.25 to 1 mg. in 0.05 to 0.1 cc. sesame oil, 2 to 4 times per wk.	Inj.	10[385]	----	236 d.
Klenitskii, 1950	50 guinea pigs	----	F	1 mg. in oil, weekly	S.C.	Tumors[386]	15 alive at 25 wks.	42 wks.
Rodriguez, 1950a	Rats[387]	----	M	50 μg. per rat per day mixed with 25 mg. of lactose and suspended in 0.5 ml. of 0.9% of sodium chloride soln. for 2.5 months	Inj.	0	72% died between 7 and 21 d. after adrenalectomy	2.5 mos.
Prigozhina, 1951	152 rats	White	M&F normal and castr.	30% in 10 mg. wax pellets, once monthly for 4 - 6 mos.	S.C.	Tumors[388]	114 alive at 4 mos.	10.5 mos.

[380] 100% fibromyomas in abdominal cavity, thoracic cavity and at operative site.
[380a] No pathology reported.
[381] Uterine adenocarcinoma in 11 animals beginning at 2 months, uterine cysts in 43 animals; metastases present in 4 cases, to subserosa of uterus, lymph nodes, peritoneum and lung.
[382] Pituitary adenomas in 10 rats after 4-5 mos.
[383] Pituitary adenoma.
[384] Pituitary adenomas.
[385] Appeared between 89 and 212 days, adenomas of the pituitary.
[386] Uterine tumors in 27 animals, tumors of peritoneum in 17 animals, fibromas and fibromyomas.
[387] 95% of the pancreas removed after 5 weeks of forced feeding. Animals were also adrenalectomized after diabetes occurred.
[388] Breast cancer in female castrate beginning at 4-5 months, in normal females beginning at 5-6 months, and in males beginning at 9-10 months.

Reference	Animal	Strain or type	Sex	Preparation and dose	Site or route	Animals with tumors	Survival	Duration of experiment
335.--4, 4'-DIHYDROXY-α,β-DIETHYLSTILBENE DISULFATE, DI-POTASSIUM SALT 								
Jaameri, 1947	4 guinea pigs	----	F	3 - 6 mg. in aqueous soln., 3 times weekly	S.C.	0	----	12.5 wks.
336.--4, 4'-DIHYDROXY-γ,δ-DIPHENYL-β,δ-HEXADIENE 								
Cardeza, 1950	Rats[389]	----	----	Daily inj. for 6 mos.	Inj.	Tumors[390]	----	6 mos.
337.--4, 4'-DIHYDROXY-γ,δ-DIPHENYL-β,δ-HEXADIENE DIACETATE 								
Adams et al., 1950	6 fowls	White leghorn	F	0.01% in the diet	P.O.	0[380a]	----	12 wks.
Sturkie and Newman, 1951	Fowls	White leghorn	F	0.02% in the diet	P.O.	0	----	32 d.
Bergstrand, 1952	2 rabbits	----	----	8 mg. in sesame oil, 3 times weekly	S.C.	0	----	36 d.
338.--γ,δ-DI-(p-HYDROXYPHENYL)-HEXANE 								
Moracci and Bracale, 1948	2 guinea pigs	----	F	Implants of 50 or 100 mg.	S.C.	0	1 killed at 30 d.	46 d.
	7 guinea pigs	----	F	1 to 5 mg. weekly for 1 to 4 mos. (total of 9 to 60 mg. over 66 to 120 d.)	I.M.	1[390a]	----	At least 120 d.
Bruzzone, 1949	5 guinea pigs	----	F, castr.	40% pellet with cholesterol (total absorbed per day 3 - 10 μg.)	S.C.	Tumors[391]	----	90 d.
Cheymol et al., 1951	10 rats	Wistar	M, castr.	4 mg. per 1 ml. propylene glycol every other day for 1 mo.	S.C.	0	----	1 mo.
	10 rats	Wistar	M	4 mg. per 1 ml. propylene glycol every other day for 1 mo.	S.C.	0	----	1 mo.
Thompson and Werner, 1951	40 rats	----	F	0.1 mg. 3 times weekly	S.C.	0	----	13 wks.
Villani and Cazzoroli, 1951	5 rats	White	M&F	1 mg. 2 times weekly	----	----	All survived	15 wks.

[380a] No pathology reported
[389] Castrated and 95% of the pancreas removed.
[390] Tumors of the pancreas. No details.
[390a] Myofibroma.
[391] Uterine fibromyomas.

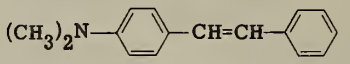
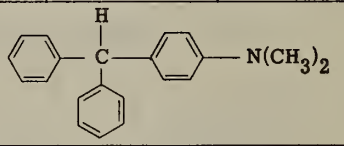
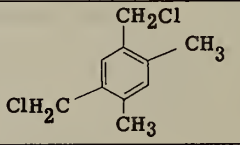
Reference	Animal	Strain or type	Sex	Preparation and dose	Site or route	Animals with tumors	Survival	Duration of experiment
339. --γ,δ-DI-(p-HYDROXYPHENYL)-HEXANE DIPROPIONATE 								
Jaameri, 1947	6 guinea pigs	----	F	3 - 6 mg., 2 times weekly	S.C.	1[392]	----	15.5 wks.
340. --1-(3, 4-DIHYROXYPHENYL)-2-ISOPROPYLAMINOETHANOL HYDROCHLORIDE 								
Dertinger et al., 1948	6 dogs	----	M&F	5 mg. per kg. body wt. daily for 6 - 17 wks.	P.O.	0	----	17 wks.
341. --p-DIMETHYLAMINOBENZALANILINE 								
Druckrey and Schmahl (unpub. data)	32 rats	BD I, BD III, white	----	10 mg. daily (total dose 1.0 g.)	P.O.	0	22 alive at 1 yr.	30 mos.
342. --4'-DIMETHYLAMINOBENZYLIDENEANILINE 								
Druckrey and Schmahl (unpub. data)	37 rats	BD I, BD III, white	----	10 mg. daily (total dose 5 g.)	P.O.	0	26 alive at 1 yr.	30 mos.
343. --4-DIMETHYLAMINOBIPHENYL 								
Miller et al., 1949	14 rats	Albino	M	0.105% in the diet for 8 mos.	P.O.	Tumors[393]	12 alive at 8 mos.	10 mos.
344. --4-DIMETHYLAMINOCHALCONE 								
Druckrey and Schmahl (unpub. data)	23 rats	BD III	----	10 mg. daily (total dose 2.5 g.)	P.O.	0[394]	20 alive at 1 yr.	30 mos.
345. --3, 2'-DIMETHYL-4-AMINODIPHENYL 								
Walpole et al., 1952	23 rats	Albino stock	M	In arachis oil daily 5 d. per wk. (average total dose 2.8 to 3.5 g. per kg.)	S.C.	Tumors[395]	----	259 d.

[392] Uterine fibroma in one animal after 15 wks.

[393] 4 mammary carcinomas, 1 sarcoma (mediastinal), 3 ear duct carcinomas, 3 benign hepatomas, 2 fibromas.

[394] 2 sarcomas in the forearm. Etiology thought dubious.

[395] 21 tumors of intestine, 1 mammary, 5 salivary gland, 4 ear duct, 1 papilloma of bladder.

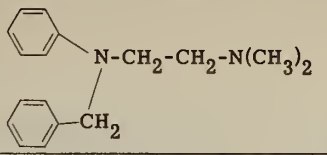
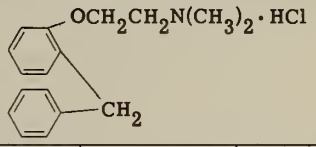
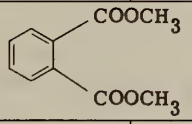
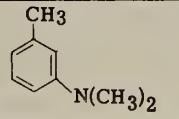
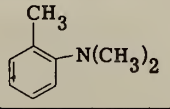
Reference	Animal	Strain or type	Sex	Preparation and dose	Site or route	Animals with tumors	Survival	Duration of experiment
346.--6-DIMETHYLAMINO-4, 4-DIPHENYL-3-HEPTANONE $CH_3CH[N(CH_3)_2]CH_2C(C_6H_5)_2COCH_2CH_3$								
Finnegan et al., 1948	72 rats	Albino	M&F	0.01 or 1.0% in the diet	P.O.	0	----	100 d.
	4 dogs	Mongrel	F	2 mg. per kg. or 5 mg. per kg. daily in 4% aqueous soln.	S.C.	0	----	100 d.
347.--4-DIMETHYLAMINOSTILBENE 								
Peacock and Peacock, 1949	6 fowls	BL	F	30 mg. pellets. Implanted in preening gland, painted with croton oil, 1% in acetone	Implantation	0	----	18 mos.
Elson, 1952	30 rats	Albino	M	In arachis oil, total of 26 mg. in 5 doses at 2 wk. intervals. 5% protein plus methionine diet	I.P.	Tumors[396]	----	At least 546 d.
	20 rats	Albino	M	In arachis oil, total of 26 mg. in 5 doses at 2 wk. intervals, 5% protein diet	I.P.	Tumors[397]	----	At least 663 d.
	20 rats	Albino	M	In arachis oil, total of 26 mg. in 5 doses at 2 wk. intervals, 20% protein diet	I.P.	Tumors[397a]	----	At least 659 d.
348.--4-DIMETHYLAMINOTRIPHENYLMETHANE 								
Druckrey and Schmahl (unpub. data)	56 rats	White	----	20 mg. daily (total dose 7.3 g.)	P.O.	0	28 alive at 1 yr.	27 mos.
	10 rats	Hybrids	----	30 mg. daily (total dose 0.4 g.)	I.P.	0	6 alive at 1 yr.	30 mos.
	10 rats	Hybrids	----	30 mg. daily (total dose 0.4 g.)	S.C.	4[398]	9 alive at 1 yr.	30 mos.
349.--1, 3-DIMETHYL-4, 6-BIS(CHLOROMETHYL)BENZENE 								
Ambrose, 1951b	25 rats	Albino	F	0.01 - 0.32% in the diet	P.O.	0	----	215 d.
	5 rats	Albino	F	0.16% in the diet	P.O.	0	----	409 d.

[396] 7 cholangioma, 1 hypernephroma.

[397] 2 lung adenoma and carcinoma, 1 skin squamous cell carcinoma, fibroma or papilloma.

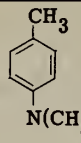
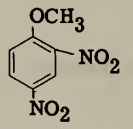
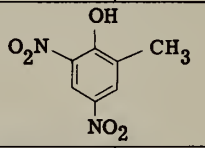
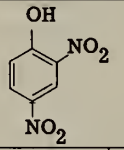
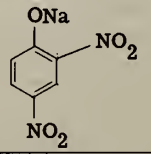
[397a] 3 cholangiomas, 1 hepatoma, 4 hypernephromas, 1 thyroid adenoma, 5 lung adenoma and carcinoma, 1 pituitary chromophobe adenoma, 1 stomach carcinoma, 1 intestine squamous cell carcinoma, 3 skin epitheliomas, fibroma, papilloma, 1 pancreas carcinoma.

[398] Histology not yet investigated; tumors were arising at the site of application after 20 until 30 months, probably sarcomas.

Reference	Animal	Strain or type	Sex	Preparation and dose	Site or route	Animals with tumors	Survival	Duration of experiment
350.--N', N'-DIMETHYL-N-BENZYL-N-PHENYLETHYLENEDIAMINE 								
Ercoli et al., 1948	10 rats	----	M&F	20 mg. per kg., 5 times a wk. for 3 mos.	P.O.[23]	0	----	3 mos.
351.--N, N-DIMETHYL-2-(α-PHENYL-o-TOLOXY)-ETHYLAMINE HYDROCHLORIDE 								
Hoekstra et al., 1953	6 dogs	----	----	10, 20 and 40 mg. per kg. daily, 6 d. per wk., in gelatin capsules	P.O.	0	100%	1 yr.
	Dogs	----	----	10 - 80 mg. per kg.	P.O.[399]	0	----	53 wks.
	20 rats	----	M&F	10 - 20 mg. daily, 6 d. per wk.	P.O.[23]	0	----	32 d.
352.--DIMETHYL PHTHALATE 								
Draize et al., 1948	120 chicks	----	----	Undiluted, daily	Skin	0	----	90 d.
	80 rabbits	----	----	Undiluted, daily	Skin	0	----	90 d.
	40 rats	----	----	Undiluted, daily	Skin	0	----	90 d.
	110 mice	----	----	Undiluted, daily	Skin	0	----	90 d.
	80 guinea pigs	----	----	Undiluted, daily	Skin	0	----	90 d.
Haag et al., 1948	3 rabbits	Albino	----	3 ml. per kg. daily applications	Skin	0	1 died	13 wks.
Haag et al., 1950	3 rabbits	Albino	----	3 ml. per kg.,	Skin	0	1 died	13 wks.
353.--N-DIMETHYL-m-TOLUIDINE 								
Druckrey et al., 1954	28 rats	BD I, BD III, and white	----	14 mg. daily (total dose 10 g.)	P.O.	0	25 alive at 1 yr.	33 mos.
354.--N-DIMETHYL-o-TOLUIDINE 								
Druckrey et al., 1954	28 rats	BD I, BD III, and white	----	14 mg. daily (total dose 10 g.)	P.O.	0	24 alive at 1 yr.	33 mos.

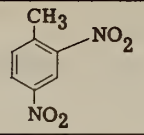
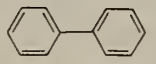
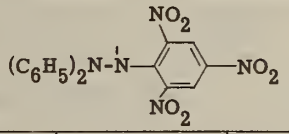
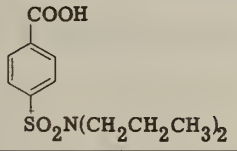
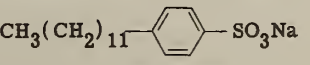
[23] Stomach tube.

[399] Stomach tube or capsules.

Reference	Animal	Strain or type	Sex	Preparation and dose	Site and route	Animals with tumors	Survival	Duration of experiment
355.--N-DIMETHYL-p-TOLUIDINE 								
Druckrey et al., 1954	28 rats	BD I, BD III, and white	----	7 mg. daily (total dose 5 g.)	P.O.	0	21 alive at 1 yr.	33 mos.
356.--2,4--DINITROANISOLE 								
Draize et al., 1948	Rabbits	----	----	3% in propylene glycol daily	Skin	0	----	90 d.
357.--3, 5-DINITRO-o-CRESOL[400] 								
Spencer et al., 1948	Rabbits	White	----	5% in olive oil, 20 applications	Skin	0	----	4 wks.
	102 rats	Dow and B & L	M	0.002 - 0.05% in the diet	P.O.	0	----	182 d.
Parker et al., 1951	Rats	Albino	----	200 p.p.m. in the diet (15 mg. per kg. per d.)	P.O.	0	----	18 wks.
	Rats	Albino	----	20 mg. per kg.	S.C.	0	----	6 wks.
358.--2, 4-DINITROPHENOL 								
Spencer et al., 1948	70 rats	Dow and B & L	M	0.01 - 0.10 in the diet	P.O.	0	----	179 d
	Rabbits	White	----	3% in 95% ethanol, 20 applications	Skin	0	----	4 wks.
359.--2, 4-DINITROPHENOL, SODIUM SALT 								
Spencer et al., 1948	8 - 10 ducks	Pekin	----	0.25% in the diet.	P.O.	0[401]	40% died	35 d.

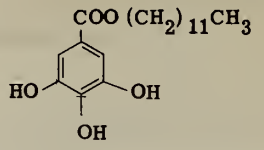
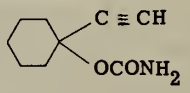
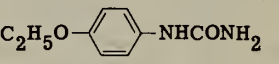
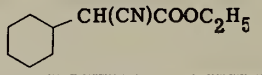
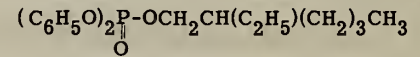
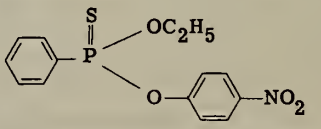
[400] Chemical Abstracts name: 4,6-Dinitro-o-cresol.

[401] Cataracts induced.

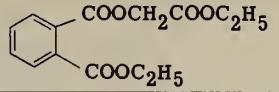
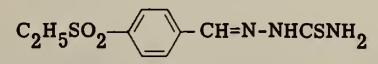
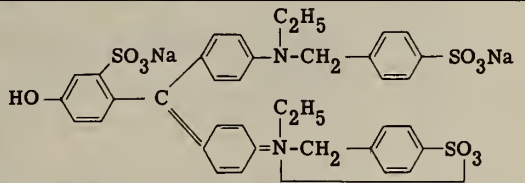
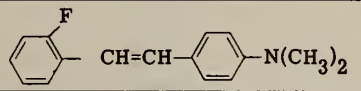
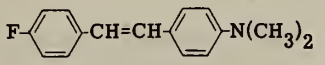
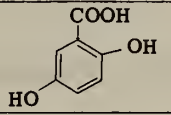
Reference	Animal	Strain or type	Sex	Preparation and dose	Site and route	Animals with tumors	Survival	Duration of experiment
360.--2, 4-DINITROTOLUENE 								
Shils and Goldwater, 1953	Rats	Sherman	----	50 mg. per ml. in corn oil or 300 or 600 mg. per 100 cc. diet up to 44 d. (various diets)	I.P. and P.O.	0	----	70 d.
361.--DIPHENYL 								
Zylberszac, 1951	Rats	White and black	M	75 mg. implants, 4 to 6 at 12 - 15 day interval	Implantation	0	----	1 yr.
362.--N, N-DIPHENYL ETHYL CARBAMATE $(C_6H_5)_2N\text{-}COOCH_2CH_3$								
Larsen, 1948	48 mice	A	M&F	0.5 mg. per gm. body wt., suspension in tricaprylin once weekly for 13 wks.	I.P.	0[402]	44 alive at 16 wks.	16 wks.
Zylberszac, 1951	Rats	White and black	M	500 mg. implants, 4 to 6 at 12 - 15 d. intervals	S.C.	0	----	1 yr.
363.--α-DIPHENYL-β-TRINITRO PHENYLHYDRAZYL 								
Boyland and Sargent, 1951	5 mice	FAK, IX	----	0.01 molar in arachis oil, 0.05 ml. in 20 sites	Intradermal	0	----	----
364.--p-(DI-n-PROPYLSULFAMYL)-BENZOIC ACID 								
McKinney et al., 1951	42 rats	Blaine Wistar	M&F	100 - 400 mg. per kg. daily as 10% aqueous soln. with 0.5% tragacanth, 5 d. per wk. for 12 wks.	P.O.[23]	0	A few died	12 wks.
	6 dogs	Mongrel	F	50 - 200 mg. per kg. per d. in gelatin capsules	P.O.	0	100% survived	8 wks.
365.--DODECYLBENZENE SODIUM SULFONATE 								
Hopper et al., 1949	10 mice	Harlan	M&F	0.2 gm. per kg. daily, 6 d. per wk.	P.O.	0	1 died	30 d.

[23] Stomach tube.

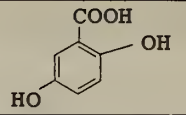
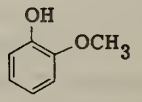
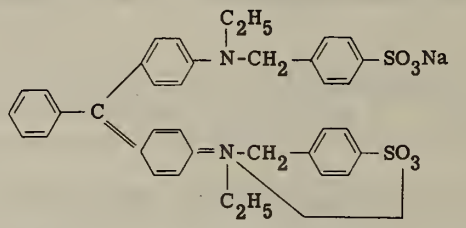
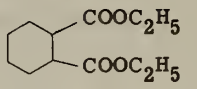
[402] 16% pulmonary adenomas, mean number 0.2 (17% in untreated controls).

Reference	Animal	Strain or type	Sex	Preparation and dose	Site and route	Animals with tumors	Survival	Duration of experiment
366. --DODECYL GALLATE 								
Allen and DeEds, 1951	45 rats	----	M&F	0.012 - 1.0% in the diet	P.O.	0	----	254 d.
van Sluis, 1951	24 rats	----	M&F	0.2% of dietary fat	P.O.	0[402a]	----	177 d.[403]
367. --ETHINYLCYCLOHEXYL CARBAMATE 								
Langecker et al., 1953	6 rats	----	----	0.1 g. per kg. in the diet	P.O.	0	----	31 d.
	2 dogs	----	----	0.016 g. per kg.	P.O.	0	----	23 wks.
368. --4-ETHOXYPHENYLUREA 								
Fitzhugh et al., 1951	100 rats	Osborne-Mendel	M&F	1.0 - 0.25% in the diet	P.O.	Tumors[404]	----	2 yrs.
369. --ETHYL CYANOCYCLOHEXYL ACETATE 								
Draize et al., 1948	60 rats	----	----	Undiluted, daily	Skin	0	----	90 d.
	90 mice	----	----	Undiluted, daily	Skin	0	----	90 d.
370. --2-ETHYLHEXYL DIPHENYL PHOSPHATE 								
Treon et al., 1953	4 rabbits	----	----	9.4 ml. per kg. undiluted	Skin	0	----	2 mos.
	6 dogs	----	----	0.5 ml. in capsules daily, and then 0.6 - 1.5% in the diet or 1.6 - 2.5% in the diet	P.O.	0	----	26 mos.
	160 rats	Carworth and Albino	M&F	0.625 - 5.0% in the diet	P.O.	0[405]	102 died	2 yrs.
371. --ETHYL p-NITROPHENYL THIONOBENZENE PHOSPHONATE 								
Frawley et al., 1952	5 rats	----	M	5 p.p.m. in the diet	P.O.	0[402a]	----	8 wks.

[402a] No pathology details.
[403] Carried on in 3rd. generation.
[404] Hepatomas, 10 at 1%, 2 at 0.5% and 1 at 0.1%. Some malignant.
[405] 24 with neoplasms, reticulum cell sarcoma, fibroadenoma, pituitary adenoma, fibrosarcoma and squamous cell carcinoma. Considered spontaneous since 40 controls developed 9 neoplasms.

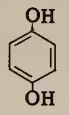
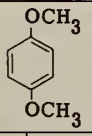
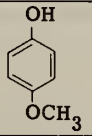
Reference	Animal	Strain or type	Sex	Preparation and dose	Site and route	Animals with tumors	Survival	Duration of experiment
372. --ETHYL PHTHALYL ETHYL GLYCOLATE 								
Hodge et al., 1953	15 rats	Albino	F	0.3 - 3.0% in the diet for 4 mos.	P.O.	0	----	4 mos.
	150 rats	----	M&F	0.05 - 5.0% in the diet	P.O.	0[406]	100% of 5% group died by 55 wks.	2 yrs.
	2 dogs	----	----	2 gm. per kg. or 0.2 gm. per kg. per d. 5 wks. or 3 mos.	P.O.	0	----	3 mos.
	6 dogs	----	M	0.01 - 0.25 gm. per kg. per d.	P.O.	0	----	1 yr.
373. --p-ETHYLSULPHONYLBENZALDEHYDE THIOSEMICARBAZONE 								
Francis et al., 1950	2 monkeys	----	----	500 mg. per kg., 1 or 2 times daily	P.O.	0	----	78 d.
374. --FAST GREEN FCF[407] 								
Willheim and Ivy, 1953	10 rats	Wistar	M&F	4% of the diet	P.O.	0	----	2 yrs.
375. --2'-FLUORO-4-DIMETHYLAMINOSTILBENE 								
Boyland and Sargent, 1951	9 mice	CBA	----	50 mg. per ml. in arachis oil, 0.05 ml. of soln. in 36 sites	Intradermal	0	----	----
376. --4'-FLUORO-4-DIMETHYLAMINOSTILBENE 								
Boyland and Sargent, 1951	11 mice	B	----	25 mg. per ml. in arachis oil, 0.05 ml. of soln. in 44 sites	Intradermal	0	----	At least 113 d.
377. --GENTISIC ACID 								
Fabinyi-Szebehely et al., 1953	10 mice	----	F	0.01 - 0.02 ml. per gm. body wt. daily for 30 d.	P.O.	0	----	30 d.
	10 rabbits	----	----	0.01 - 0.02 ml. per gm. body wt. daily for 30 d.	P.O.	0	----	30 d.

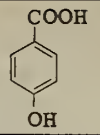
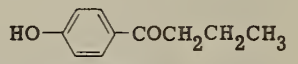
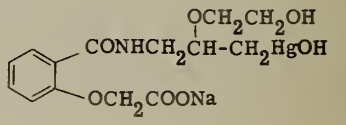
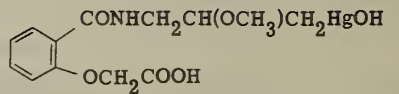
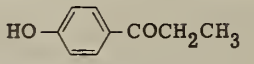
[406] 6 rats with tumors of lung, testis and breast. (Not attributed to treatment.)
[407] (FD&C Green III)

Reference	Animal	Strain or type	Sex	Preparation and dose	Site and route	Animals with tumors	Survival	Duration of experiment
377.--GENTISIC ACID--Continued 								
Fabinyi-Szebehely et al., 1953	10 rats	----	----	0.01 - 0.02 ml. per gm. body wt. daily for 30 d.	P.O.	0	----	30 d.
	10 guinea pigs	----	----	0.01 - 0.02 ml. per gm. body wt. for 30 d.	P.O.	0	----	30 d.
378.--GUAIACOL 								
Ezeyza, 1952a	26 rats	White	M&F	1 - 4% in olive oil, 26 inj.	S.C.	0	7 alive at 17 mos.	17 mos.
Ezeyza, 1952b, c	26 rats	----	M&F	0.2 cc. of a 1% soln. in olive oil to 0.4 cc. of a 4% soln. (total of 26 inj. given at intervals)	S.C.	0	20 alive at 6 mos., 7 at 17 mos.	19 mos.
379.--GUINEA GREEN B[408] 								
Willheim and Ivy, 1953	10 rats	Wistar	M&F	4% of the diet	P.O.	Tumors[409]	----	2 yrs.
380.--HEXAHYDROPHTHALIC ACID DIETHYL ESTER 								
Draize et al., 1948	40 rats	----	----	Undiluted, daily	Skin	0	----	90 d.
	60 mice	----	----	Undiluted, daily	Skin	0	----	90 d.
381.--HYDRACRYLIC ACID β-PHENYLETHYL ESTER $CH_2OHCH_2COOCH_2CH_2C_6H_5$								
Draize et al., 1948	40 rats	----	----	Undiluted, daily	Skin	0	----	90 d.
	80 mice	----	----	Undiluted, daily	Skin	0	----	90 d.

[408] (FD&C Green I).

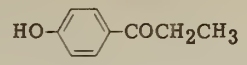
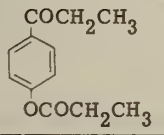
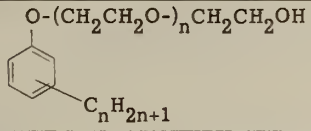
[409] 2 lymphosarcomas. (No tumors in 50 controls).

Reference	Animal	Strain or type	Sex	Preparation and dose	Site and route	Animals with tumors	Survival	Duration of experiment
382. --HYDROQUINONE 								
Miller and Miller, 1948	6 rats	Sprague-Dawley	M	0.029% in the diet for 9 mos.	P.O.	0	----	9 mos.
Carlson and Brewer, 1953	Rats	Sprague-Dawley	M&F	0.1 - 0.5% in the diet, heated with lard	P.O.	0	----	104 wks.
	60 rats	Sprague-Dawley	M&F	0.1 - 1.0% in the diet	P.O.	0	----	104 wks.
	14 rats	Sprague-Dawley	M&F	5% in the diet	P.O.	0	----	9 wks.
	2 dogs	Mongrel	M&F	1.6 mg. per kg. per day for 31 wks. and then 40 mg. per kg. per day for 49 wks.	P.O.	0	----	80 wks.
	1 dog	Mongrel	----	16 mg. per kg. per d. in the diet for 80 wks.	P.O.	0	----	80 wks.
	5 dogs	Mongrel	M	100 mg. per kg. per d. in the diet for 26 wks.	P.O.	0	----	26 wks.
	16 rats	Sprague-Dawley	----	500 mg. per kg. in the diet (101 doses)	P.O.	0	----	151 d.
	120 rats	Sprague-Dawley	M&F	0.1 - 1.0% in the diet. Also 0.1% citric acid	P.O.	0	----	104 wks.
383. --HYDROQUINONE DIMETHYL ETHER 								
Hodge et al., 1949	30 rats	----	M&F	0.5 - 10.1% in the diet	P.O.	0	100% alive	5 wks.
	12 rabbits	----	----	1.0 - 10.0% in the diet	P.O.	0	100% alive	9 wks.
	3 dogs	----	----	1 - 12 gm. daily	P.O.	0	100% alive	12 wks.
384. --HYDROQUINONE MONOMETHYL ETHER 								
Hodge et al., 1949	3 dogs	----	----	1 - 12 gm. daily	P.O.	0	100% alive	12 wks.
	18 rabbits	----	----	1.0 - 10.0% in the diet	P.O.	0	100% alive	2 mos.
	60 rats	----	M&F	0.02 - 5.0% in the diet	P.O.	0	100% alive	7 wks.

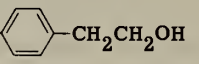
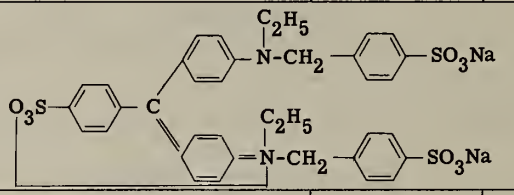
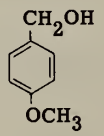
Reference	Animal	Strain or type	Sex	Preparation and dose	Site and route	Animals with tumors	Survival	Duration of experiment
385. --p-HYDROXYBENZOIC ACID 								
Fabinyi-Szebehely et al., 1953	10 mice	----	F	0.01 - 0.02 ml. per gm. body wt. daily for 30 d.	P.O.	0	----	30 d.
	10 rabbits	----	----	0.01 - 0.02 ml. per gm. body wt. daily for 30 d.	P.O.	0	----	30 d.
	10 rats	----	----	0.01 - 0.02 ml. per gm. body wt. daily for 30 d.	P.O.	0	----	30 d.
	10 guinea pigs	----	----	0.01 - 0.02 ml. per gm. body wt. daily for 30 d.	P.O.	0	----	30 d.
386. --p-HYDROXYBUTYROPHENONE 								
Chamorro et al., 1953	Rats	Wistar	M&F	10 or 20 mg. in propylene glycol (200 mg. per ml.), 6 d. per wk.	S.C.	0	----	31 d.
387. --o-(N-γ-HYDROXYMERCURI-β-HYDROXYETHOXYPROPYL-CARBAMYL)-PHENOXYACETIC ACID, SODIUM SALT 								
Robbins and Chen, 1951	20 rats	Albino	----	5.5 - 33 mg. per kg. daily, 5 d. per wk. for 1 mo.	I.M.	0	----	1 mo.
388. --2-[(3'-HYDROXYMERCURI-2'-METHOXYPROPYL)-CARBAMYL]-PHENOXYACETIC ACID[410] 								
Blumberg et al., 1952	8 rabbits	New Zealand, Albino	----	5 or 10 mg. Hg per kg. twice weekly	I.M.	0	4 died	2 mos.
389. --p-HYDROXYPROPIOPHENONE 								
Bruzzone and Lipschütz, 1952	Guinea pigs	----	F	Pellets, 10 mg. per day and 31 mg. per day	Implantation	0	----	49 d.
Danowski et al., 1952	29 rats	Wistar	F	2.0%	P.O.	0[411]	----	42 d.

[410] Theophylline salt.

[411] Thyroid hyperplasia.

Reference	Animal	Strain or type	Sex	Preparation and dose	Site and route	Animals with tumors	Survival	Duration of experiment
389.--p-HYDROXYPROPIOPHENONE--Continued 								
Rodriguez and Penhos, 1952	Rats[412]	----	F	40 mg. per day for 6 mo.	Orally	0	----	6 mos.
Scott et al., 1952	4 rats	----	M	600 or 60 mg. per kg. for first 2 d. and thereafter 0.1 - 1.0% in the diet	P.O.[23]	0	----	53 d.
	30 rats	----	F	0.1 - 1.0% in the diet	P.O.	0	Killed at intervals	At least 5 mos.
Caltabiano et al., 1953	12 rabbits	----	M&F	100 mg. per day in diet. Some animals on high cholestrol-lipid diet	P.O.	0	----	90 d.
390.--p-HYDROXYPROPIOPHENONE PROPIONATE 								
Sanfilippo, 1953	20 rats[413]	----	F	0.15 mg. per g. body wt. in almond oil, every other day	S.C.	0[413a]	----	5 mos.
391.--IGEPAL CA 								
Hopper et al., 1949	10 mice	Harlan	M&F	0.35 gm./kg. daily, 6 d. per wk.	P.O.	0	3 died	30 d.
392.--ISOPROPYL CINNAMATE								
Draize et al., 1948	60 guinea pigs	----	----	Undiluted, daily	Skin	0	----	90 d.
393.--ISOPROPYL-N-PHENYL CARBAMATE $C_6H_5NH\text{-}COOCH(CH_3)_2$								
Hueper, 1952a	50 mice	----	----	0.1% in the diet	P.O.	0	15 died by 6 mos.	18 mos.
	50 mice	C	M&F	0.5% in the diet	P.O.	0	17 died in 2 mos.	18 mos.
	30 mice	A and C	M&F	1% in the diet	P.O.	0	25 died in 2 mos.	6 mos

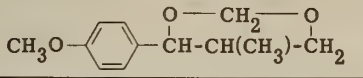
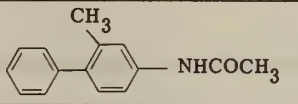
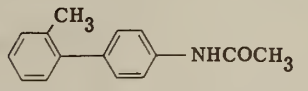
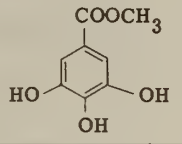
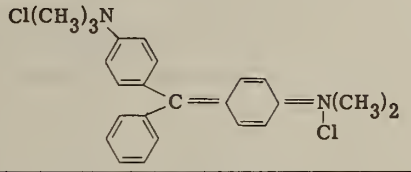
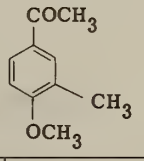
[23] Stomach tube.
[412] Ovaries and 95% of the pancreas removed.
[413] 4 different age groups; after 3 months of treatment females were put with males. Pregnancies in older age groups.
[413a] No pathology recorded.

Reference	Animal	Strain or type	Sex	Preparation and dose	Site and route	Animals with tumors	Survival	Duration of experiment
393.--ISOPROPYL-N-PHENYL CARBAMATE--Continued $C_6H_5NH\text{-}COOCH(CH_3)_2$								
Hueper, 1952a	15 rats	Osborne-Mendel x Hairless	----	2% in the diet	P.O.	0	8 died at 18 mos.	18 mo.
	15 rats	Osborne-Mendel, mixed breed	F	40 mg. per 100 gm. body wt., suspension in lanolin once a month for 6 mos.	I.M.	0[414]	3 died in 14 mos.	18 mos.
	60 mice	C	M&F	40 mg. per 100 gm. body wt., suspension in lanolin once every two weeks for 6 mos.	I.M.	0	18 died at 13 mos. - 18 mos.	18 mos.
	15 rats	Osborne-Mendel mixed	M	40 mg. per 100 gm. body wt. in lanolin once a month for 6 mos.	Intrapleural	0	6 died in 14 mos.	18 mos.
	60 mice	C	M&F	40 mg. per 100 gm. body wt., suspension in lanolin once every two wks. for 6 mos.	Intrapleural	0	----	18 mos.
394.--p-ISOPROPYLPHENYLETHYL ALCOHOL 								
Draize et al., 1948	70 rats	----	----	Undiluted, daily	Skin	0	----	90 d.
	100 mice	----	----	Undiluted, daily	Skin	0	----	90 d.
395.--LIGHT GREEN F.S.[415] 								
Willheim and Ivy, 1953	10 rats	Wistar	M&F	4% of the diet	P.O.	Tumors[416]	----	2 yrs.
396.--p-METHOXYBENZYL ALCOHOL 								
Draize et al., 1948	90 mice	----	----	Undiluted, daily	Skin	0	----	90 d.
	50 rats	----	----	Undiluted, daily	Skin	0	----	90 d.

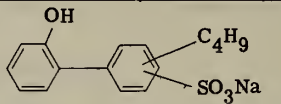
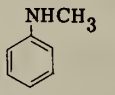
[414] 2 adenomyomas of uterus and 1 adenocarcinoma of breast seen, but considered spontaneous.

[415] Called Light Green SF Yellowish; FD&C Green 2.

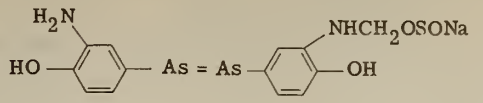
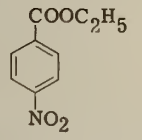
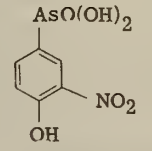
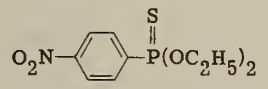
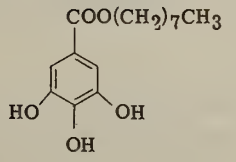
[416] 1 lymphosarcoma (no tumors in 50 controls).

Reference	Animal	Strain or type	Sex	Preparation and dose	Site and route	Animals with tumors	Survival	Duration of experiment
397. --1-(p-METHOXYPHENYL)-2-METHYL-1, 3-PROPANEDIOL METHYLENE ETHER 								
Draize et al., 1948	50 rats	----	----	Undiluted, daily	Skin	0	----	90 d.
	50 mice	----	----	Undiluted, daily	Skin	0	----	90 d.
398. --2-METHYL-4-ACETYLAMINOBIPHENYL 								
Sandin et al., 1952	18 rats	----	M&F	1.62 m.mols. per kg. in the diet for 8 mos.	P.O.	0	----	10 mos.
399. --2'-METHYL-4-ACETYLAMINOBIPHENYL 								
Sandin et al., 1952	18 rats	----	M&F	1.62 m.mols. per kg. in the diet for 8 mos.	P.O.	0	----	10 mos.
400. --METHYL GALLATE 								
van Sluis, 1951	24 rats	----	M&F	0.2% of dietary fat	P.O.	0	----	177 D.[417]
401. --METHYL GREEN 								
Druckrey and Danneberg (unpub. data)	19 rats	Hybrids	----	20 mg. daily (total dose 11.5 g.)	P.O.	0	17 alive after 1 yr.	32 mos.
402. --3-METHYL-4-METHOXYACETOPHENONE 								
Draize et al., 1948	70 rats	----	----	Undiluted, daily	Skin	0	----	90 d.
	70 mice	----	----	Undiluted, daily	Skin	0	----	90 d.

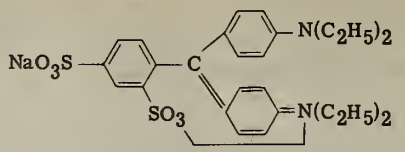
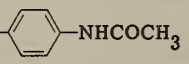
[417] Carried on to 3rd. generation.

Reference	Animal	Strain or type	Sex	Preparation and dose	Site and route	Animals with tumors	Survival	Duration of experiment
403. --METHYLPHENYLSILICONE [419] $[C_6H_5Si(CH_3)\text{-}O]_x[(CH_3)_2Si\text{-}O]_y$								
Rowe et al., 1948	Rats	Wistar	----	One dose of either 0.1 - 10.0 ml. per kg.	I.P.	0	----	90 d.
	Rabbits	----	----	20 applications	Skin	0	----	1 mo.
404. --MONOBUTYLPHENYL-PHENOL SODIUM MONOSULFONATE [418] 								
Hopper et al., 1949	20 mice	Harlan	M&F	0.35 or 0.38 gm. per kg. daily, 6 d. per wk.	P.O.	0	9 died	30 d.
405. --N-MONOMETHYLANILINE 								
Treon et al., 1949a	5 rabbits	----	----	0.10 - 0.39 g. per kg. for periods of 1 hr., 12 - 27 times	Skin	0	1 died after 12 applications	50 d.
	4 rabbits	----	----	0.024 g. per kg. as 10% (W/V) in propylene glycol, 5 d. per wk., 77 - 100 doses	P.O.	0	100% lived	Over 20 wks.
	7 rabbits	----	----	0.055 - 0.18 g. per kg., 10% W/V in propylene glycol	P.O.	0	1 died at 1 mo.	2 mos.
Treon et al., 1950	3 rats	----	----	7.6 p.p.m., 130 seven hr. exposures	Inhalation	0	1 died	Over 26 wks.
	2 rats	----	----	2.4 p.p.m., 130 seven hr. exposures	Inhalation	0	100% alive	Over 26 wks.
	2 rats	----	----	26.6 p.p.m., 58 seven hr. exposures	Inhalation	0	100% alive	Over 11 wks.
	2 rats	----	----	86 p.p.m., 50 seven hr. exposures	Inhalation	0	100% alive	Over 10 wks.
	4 rabbits	----	----	2.3 p.p.m., 130 seven hr. exposures	Inhalation	0	100% alive	Over 26 wks.
	7 rabbits	----	----	7.6 p.p.m., 130 seven hr. exposures	Inhalation	0	6 died	Over 26 wks.
	4 rabbits	----	----	26.6 p.p.m., 58 seven hr. exposures	Inhalation	0	2 died	Over 10 wks.
	6 rabbits	----	----	86 p.p.m., 50 seven hr. exposures	Inhalation	0	3 died	Over 10 wks.
	1 monkey	----	----	2.4 p.p.m., 130 seven hr. exposures	Inhalation	0	----	Over 26 wks.
	3 cats	----	----	26.6 p.p.m., 58 seven hr. exposures	Inhalation	0	2 died	Over 11 wks.
	5 cats	----	----	2.4 or 7.6 p.p.m., 130 seven hr. exposures	Inhalation	0	----	Over 26 wks.
406. --MONO-N-METHYLANILINE HYDROCHLORIDE								
White and Mori-Chavez 1951	40 rats	Osborne-Mendel	M&F	0.06% in the diet for 479 to 562 d., 0.5% L-cystine	P.O.	0[420]	Sacrificed at various intervals	At least 758 d.

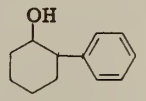
[418] Trade name: Areskap 100.
[419] DC-550 Fluid and DC-702 Fluid.
[420] 10 rats had acute necrotizing renal papillitis.

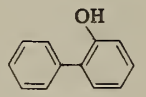
Reference	Animal	Strain or type	Sex	Preparation and dose	Site and route	Animals with tumors	Survival	Duration of experiment
407. --NEOARSPHENAMINE 								
Ezeyza, 1952b	26 rats	----	M&F	2 mg. in 0.4 cc. of olive oil (total dose about 30 mg.)	S.C.	0	15 alive at 6 mos., 7 at 1 yr. 1 at 20 mos.	20 mos.
408. --p-NITROBENZOIC ACID ETHYL ESTER 								
Abramson, 1953	84 rats	Wistar	M	0.5 - 2.0% of the diet for 12 wks.	P.O.	0	10 died	12 wks.
409. --3-NITRO-4-HYDROXYPHENYLARSONIC ACID 								
Hendrick et al., 1953	7 rats	Sprague-Dawley	M&F	In the diet as 25.6 p.p.m. arsenic	P.O.	0[420a]	100% alive	60 d.
410. --p-NITROPHENYL DIETHYL THIOPHOSPHATE[421] 								
Barnes and Denz, 1951b	252 rats	Albino	M&F	10 - 50 p.p.m. in the diet	P.O.	0[422]	210 alive at 365 d.	365 d.
Frawley et al., 1952	5 rats	----	M	1 p.p.m. in the diet	P.O.	0[420a]	----	8 wks.
411. --OCTYL GALLATE 								
van Sluis, 1951	24 rats	----	M&F	0.2% of dietary fat	P.O.	0[420a]	----	177 d.[423]

[420a] No pathological report.
[421] 78% pure only.
[422] 1 sarcoma in mediastinum, not attributed to experiment
[423] Carried on to 3rd generation.

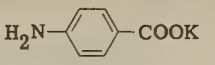
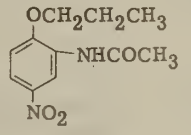
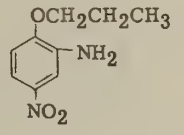
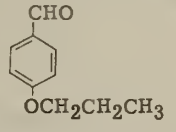
Reference	Animal	Strain or type	Sex	Preparation and dose	Site and route	Animals with tumors	Survival	Duration of experiment
412. --PATENT BLUE V.[424] 								
Miller (unpub. data)	20 mice	A_2G	M&F	1.25% aqueous, ad lib. in water	P.O.	Tumors[425]	----	28 mos.
	Mice	A_2G	M&F	0.5 cc. 2.5% suspension in arachis oil per mouse once weekly (12.5 mg. dye per mouse per inj. up to 33 inj.)	S.C.	0	----	28 mos.
	Mice	A_2G	M&F	5.0% soln. on bread (100 mg. dye per mouse daily except Sundays)	P.O.	0	----	28 mos.
	10 rats	Scott Hooded	M&F	Feeding and drinking on alternate wks. 1.25% aqueous ad lib. in water or 200 mg. per rat in the diet, 6 d. per wk.	P.O.	0	----	29 mos.
	20 mice	A_2G	M&F	Saturated soln. in acetone for 7 wks., then saturated soln. in isopropyl alcohol for 13 mos., then saturated soln. in 90% ethyl alcohol for 6 mos.	Skin	Tumors[426]	----	28 mos.
413. --PERBENZOIC ACID $C_6H_5CO_3H$								
Boyland and Sargent, 1951	13 mice	C57	----	0.07 molar in aqueous soln., 0.05 ml. in 52 sites	Intradermal	0	----	At least 30 d.
414. --PHENACETIN 								
Schmahl and Reiter, 1954	30 rats	BD I, BD III, Wistar	----	50 mg. daily (total dose 22 g.)	P.O.	0	28 alive after 1 yr.	33 mos.
415. --2-PHENOXYETHYL ACETATE $CH_3COOCH_2CH_2OC_6H_5$								
Draize et al., 1948	60 rats	----	----	Undiluted, daily	Skin	0	----	90 d.
	70 mice	----	----	Undiluted, daily	Skin	0	----	90 d.
416. --PHENYLACETYLUREA $C_6H_5CH_2CONHCONH_2$								
Everett and Richards, 1952	Cats	----	----	100 - 150 mg. per kg. in the diet	P.O.	0	----	1 yr.

[424] Color Index No. 672.
[425] 2 leukemias, one in male at 12 months and 1 in female at 22 months.
[426] 3 leukemias in females at 6, 19 and 27 months.

Reference	Animal	Strain or type	Sex	Preparation and dose	Site and route	Animals with tumors	Survival	Duration of experiment
416.--PHENYLACETYLUREA--Continued $C_6H_5CH_2CONHCONH_2$								
Everett and Richards, 1952	8 dogs	----	----	100 - 700 mg. per kg. in the diet	P.O.	0	----	24 mos.
	Rats	----	----	3.0% in the diet	P.O.	0	----	6 mos.
	Rats	----	----	0.5% and 1.0% in the diet	P.O.	0	----	18 mos.
417.--2-PHENYLCYCLOHEXANOL 								
Draize et al., 1948	50 mice	----	----	Undiluted, daily	Skin	0	----	90 d.
	50 guinea pigs	----	----	Undiluted, daily	Skin	0	----	90 d.
	40 rabbits	----	----	Undiluted, daily	Skin	0	----	90 d.
	50 rats	----	----	Undiluted, daily	Skin	0	----	90 d.
418.--2-PHENYLETHYLα-HYDROXYISOBUTYRATE $(CH_3)_2C(OH)-COOCH_2CH_2C_6H_5$								
Draize et al., 1948	60 rats	----	----	Undiluted, daily	Skin	0	----	90 d.
	70 mice	----	----	Undiluted, daily	Skin	0	----	90 d.
	60 guinea pigs	----	----	Undiluted, daily	Skin	0	----	90 d.
	50 rabbits	----	----	Undiluted, daily	Skin	0	----	90 d.
419.--PHENYLHYDRAZINE $C_6H_5NHNH_2$								
Jacobson et al., 1949	2 rabbits	----	----	40 mg.	S.C.	0	----	35 d.
420.--PHENYLMERCURIC ACETATE $C_6H_5HgOCOCH_3$								
Fitzhugh et al., 1950b	132 rats	----	M&F	0.1 - 160 p.p.m.	P.O.	0	All died by 18 mos.	2 yrs.

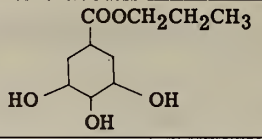
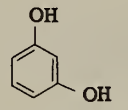
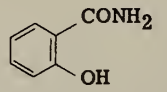
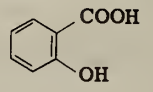
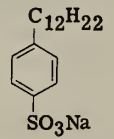
Reference	Animal	Strain or type	Sex	Preparation and dose	Site and route	Animals with tumors	Survival	Duration of experiment
421. --1-PHENYL-2-(METHYLAMINO)-PROPANE $C_6H_5\text{-}CH_2\text{-}CH(NHCH_3)\text{-}CH_3$								
Kawamura, 1953	60 mice	----	----	0.05 - 5 mg. per 10 g. body wt. in aq. soln.	S.C.	0	----	6 wks.
	Rabbits	----	----	1 - 5 mg. per kg. body wt. in aq. soln.	S.C.	0	----	9 wks.
	Rabbits	----	F	1 - 6 mg. per kg. body wt.	S.C.	0	----	5 mos.
	Mice	----	----	0.1 mg. per 10 g. body wt.	S.C.	0	----	83 d.
	6 rabbits	----	----	1 - 7 mg. per kg. body wt.	S.C.	0	----	259 d.
422. --o-PHENYLPHENOL 								
Hodge et al., 1952c	48 rats	----	M&F	0.1 - 2.0% of the diet	P.O.	0	----	3 mos.
	150 rats	Wistar	M&F	0.02 - 2% of the diet	P.O.	0[427]	68 alive at 1 yr.	2 yrs.
	Dogs	----	M&F	0.02 - 0.5 gm. per kg. daily	P.O.	0	1 died at 6 mos.	1 yr.
423. --POLYETHYLENEGLYCOL MONOISOOCTYLPHENOL ETHER[427a] $H[\text{-}OCH_2CH_2]_x\text{-}O\text{-}C_6H_4\text{-}C(CH_3)_2CH_2C(CH_3)_3$								
Fitzhugh and Nelson, 1948b	5 rats	Osborne-Mendel	M	8% in the diet	P.O.	0	All died in 1 wk.	16 wks.
	5 rats	Osborne-Mendel	M	4% in the diet	P.O.	0	2 died in 1 wk.	16 wks.
	20 rats	Osborne-Mendel	M	0.25 - 2% in the diet	P.O.	0	----	16 wks.
424. --POLYSTYRENE $(C_6H_5\text{-}CH\text{-}CH_2\text{-})_x$								
Druckrey and Schmahl (unpub. data)	50 rats	BD I, BD III, and Wistar	----	2 film-discs	Implanted	13[428]	39 alive at 1 yr.	27 mos.

[427] "Occasional tumors" not thought associated with treatment.
[427a] Triton NE or X100.
[428] Sarcomas at the site of application after 11 until 25 months. Etiology certain.

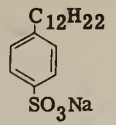
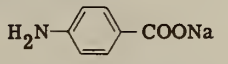
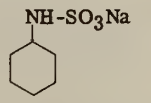
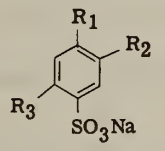
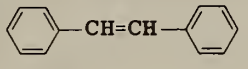
Reference	Animal	Strain or type	Sex	Preparation and dose	Site and route	Animals with tumors	Survival	Duration of experiment
425. --POTASSIUM p-AMINOBENZOATE 								
Upton and Zarafonetis, 1950	10 rats	Albino	M&F	2 mg. per kg. in the diet	P.O.	0[429]	6 sacrificed at 3 mos.	6 mos.
426. --1-PROPOXY-2-ACETAMIDO-4-NITROBENZENE 								
Hannig, 1953	Rats	----	----	516 mg. per kg.	P.O.	0	----	2 mos.
427. --1-n-PROPOXY-2-AMINO-4-NITROBENZENE 								
Fitzhugh et al., 1951	144 rats	Osborne-Mendel	M&F	0.001 - 1.0% in the diet	P.O.	0[430]	----	2 yrs.
Hannig, 1953	Rats	----	----	266 mg. per kg.	P.O.	0	----	2 mos.
428. --p-(n-PROPOXY)-BENZALDEHYDE 								
Draize et al., 1948	90 mice	----	----	Undiluted, daily	Skin	0	----	90 d.
	70 rats	----	----	Undiluted, daily	Skin	0	----	90 d.
429. --n-PROPYL CINNAMATE $C_6H_5CH=COOCH_2CH_2CH_3$								
Draize et al., 1948	50 guinea pigs	----	----	Undiluted, daily	Skin	0	----	90 d.
	60 mice	----	----	Undiluted, daily	Skin	0	----	90 d.

[429] Thyroid hyperplasia.

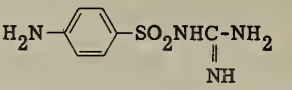
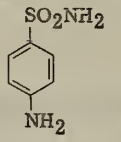
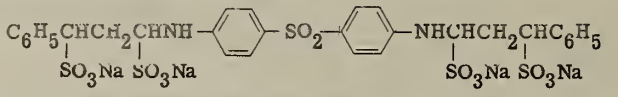
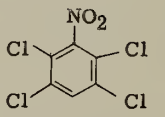
[430] Enlargement and hyperplasia of the thyroids.

Reference	Animal	Strain or type	Sex	Preparation and dose	Site and route	Animals with tumors	Survival	Duration of experiment
				430.--PROPYL GALLATE 				
Orten et al., 1948	7 dogs	Mongrel	F	0.0117% in the diet	P.O.	0	100% alive	14 mos.
	20 guinea pigs	----	M&F	0.0117% in the diet	P.O.	0	----	1 yr.
	126 rats	Albino	M&F	0.00117 - 2.34% in the diet	P.O.	0	Some died	2 yrs.
				431.--RESORCINOL 				
Doniach and Logothetopoulos, 1953	3 rats	Albino	M&F	1.5 g. in 100 ml. arachis oil (0.14 m.mol. per 100 g. body wt.) injected in 2 ml. amounts twice daily	S.C.	0	Sacrificed	69 d.
				432.--SALICYLAMIDE 				
Drebinger, 1952	Mice	----	----	0.25 g. per kg. in drinking water (total dose 17 g. per kg.)	P.O.	0	----	67 d.
				433.--SALICYLIC ACID 				
Herz and Stampfl, 1951	2 mice	----	----	0.2% saturated soln., 0.1 mg. per kg. body wt. 3 times daily	P.O.	0	1 died, 1 sacrificed at 34 d.	34 d.
	9 mice	----	----	0.2% saturated soln., 0.1 mg. per kg. body wt. once	P.O.	0	----	57 d.
	2 rabbits	----	----	0.1 mg. per g. body wt. daily for 50 d.	----	0	Sacrificed at 50 d.	50 d.
				434.--SODIUM ALKYL ARYL SULFONATE[432a]  **(in part)**				
Fitzhugh and Nelson, 1948b	20 rats	Osborne-Mendel	M	0.5, 1, 2 and 4% in the diet	P.O.	0	5 died in 1 wk. with 4%	16 wks.

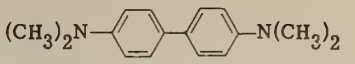
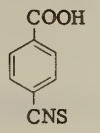
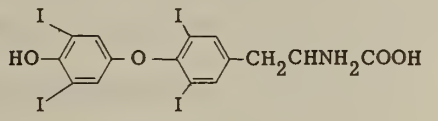
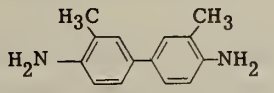
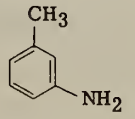
[432a] D-40, Oronite Chemical Co.

Reference	Animal	Strain or type	Sex	Preparation and dose	Site and route	Animals with tumors	Survival	Duration of experiment
434.--SODIUM ALKYL ARYL SULFONATE--Continued  **(in part)**								
Hine et al., 1953a	30 rats	Long Evans	M&F	0.232, 0.58 or 1.16 mg. per kg. in diet	P.O.	0	----	45 d.
	40 rats	Long Evans	M&F	1, 10 or 20 p.p.m. in the diet	P.O.	0	----	6 mos.
435.--SODIUM p-AMINOBENZOATE 								
Upton and Zarafonetis, 1950	10 rats	Albino	M&F	2 gm. per kg. in the diet	P.O.	0[433]	6 sacrificed at 3 mos.	6 mos.
436.--SODIUM CYCLOHEXYL SULPHAMATE 								
Fitzhugh et al., 1951	100 rats	Osborne-Mendel	M&F	1.0 - 5.0% in the diet	P.O.	0	----	2 yrs.
Richards et al., 1951	4 dogs	----	----	0.5 or 1 gm. daily in the diet	P.O.	0	3 alive	15 mos.
	Rats	----	----	0.5 or 1.0% in the diet	P.O.	0	----	30 mos.
	4 dogs	----	----	2 or 4 gm. per kg. daily	P.O.[23]	0	100% alive	1 mo.
437.--SODIUM POLYALKYL ARYL SULPHONATE[434]  $R_1 + R_2 + R_3 = C_{15-16}H_{31-33}$								
Hine et al., 1953a	30 rats	Long Evans	M&F	0.232 - 1.16 mg. per kg. in the diet	P.O.	0	----	45 d.
	40 rats	Long Evans	M&F	1 - 20 p.p.m. in the diet	P.O.	0	----	6 mos.
438.--STILBENE 								
Druckrey and Danneberg (unpub. data)	30 rats	Hybrids	----	20 - 40 mg. (total dose 650 mg.)	S.C.	0	10 alive at 1 yr.	32 mos.

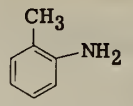
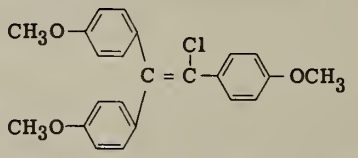
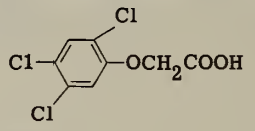
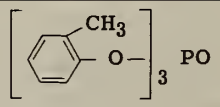
[23] Stomach tube.
[433] Thyroid hyperplasia.
[434] OWA.

Reference	Animal	Strain or type	Sex	Preparation and dose	Site and route	Animals with tumors	Survival	Duration of experiment
439.--SULFAGUANIDINE 								
Granados et al., 1950	24 rats	----	M	1% in the diet. 12 with Vitamin E rich diet	P.O.	0	----	70 d.
440.--SULFANILAMIDE 								
Haerem, 1948	10 rats	----	----	0.015 gm. in lard, two inj. at different sites	S.C.	2 sarc.[435]	3 died by 13 mos.	16 mos.
Figge et al., 1949	Mice	C3H, C57 and A	----	Various	P.O.	0	----	5 yrs.[436]
Hung and Delost, 1952	Rats	Comentry	M	2% in the diet	P.O.	0	----	1 mo.
441.--SULPHETRONE 								
Browniee et al., 1948	Rats	----	M&F	1% in the diet	P.O.	0	----	78 d.
	4 rabbits	----	M&F	4% in the diet	P.O.	0[435a]	1 died after 15 d.	40 d.
442.--2, 3, 5, 6-TETRACHLORONITROBENZENE 								
Buttle and Dyer, 1950	24 mice	----	----	672 mg. and 67.2 mg. per 50 gm. diet for 31 d.	P.O.	0	100% alive	31 d.
	24 mice	----	----	4.3 and 35 mg. per 20 gm. body wt. daily for 31 d.	P.O.	0	100% alive	31 d.
	30 rats	Albino	M&F	4 - 100 mg. per 5 gm. diet for 10 wks.	P.O.	0	10 died at 5 wks.	10 wks.

[435] Spindle cell; one metastasized and was transplanted.
[435a] No detailed pathological examination.
[436] 8 generations.

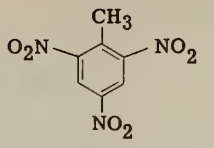
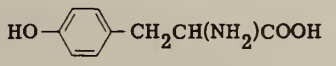
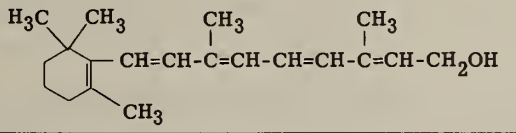
Reference	Animal	Strain or type	Sex	Preparation and dose	Site and route	Animals with tumors	Survival	Duration of experiment
443.--4, 4'-TETRAMETHYLDIAMINODIPHENYL 								
Zylberszac, 1951	Rats	White and black	M	55 mg. implants (9 in 3 mos.)	S.C.	0[437]	----	3 mos.
444.--p-THIOCYANOBENZOIC ACID 								
Tawab et al., 1949	2 dogs	----	----	20 mg. daily	P.O.	0[438]	----	30 d.
445.--THYROXINE 								
Grad and Leblond, 1949	10 rats[439]	----	M	3 μg. per 0.1 cc. water twice daily	S.C.	0	----	47 d.
Korenchevsky, 1950	Rats	----	M&F	0.6 mg. twice weekly for 47 - 53 d. Some supplemented with Vitamin B complex; some supplemented with ascorbic acid	S.C.	0	----	53 d.
446.--o-TOLIDINE 								
Gehrmann et al., 1949	3 dogs	----	----	230 mg. daily	P.O.	0	----	3 yrs.
Spitz et al., 1950	105 rats	Sherman	M&F	60 mg. in 1 cc. olive oil or butyl succinate once weekly (total 5.5 gm.)	S.C.	Tumors[440]	48 alive at 300 d.	600 d.
447.--m-TOLUIDINE 								
Ekman and Strömbeck, 1949	36 rats a	----	M&F	0.1% in the diet for 83 to 368 d. (Various diets given)	P.O.	0[441]	----	368 d.

[437] Liver cirrhosis.
[438] Hyperplasia of the thyroid gland.
[439] Thyroidectomized and castrated.
[440] 5 ear duct carcinomas.
[441] 7 rats with metaplasia of bladder epithelium.

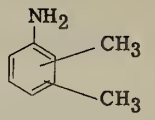
Reference	Animal	Strain or type	Sex	Preparation and dose	Site and route	Animals with tumors	Survival	Duration of experiment
448.--o-TOLUIDINE 								
Ekman and Strömbeck, 1949	36 rats a	----	M&F	0.1% in the diet for 11 to 276 d. (Various diets given).	P.O.	0[442]	----	276 d.
449.--TRI-p-ANISYLCHLOROETHYLENE 								
Gardner and Boddaert, 1950	92 mice	C57 and CBA	----	50 or 100 μg. in 0.05 cc. sesame oil weekly	S.C.	48[443]	76 alive at 20 mos.	At least 20 mos.
Thompson and Werner, 1951	40 rats	----	F	5 mg. 3 times weekly for 13 wks.	S.C.	0	----	13 wks.
	Monkeys	----	F	70 mg. (one dose)	P.O.	0	----	80 d.
	18 rats	----	F, castr.	1 mg. (one dose)	S.C.	0	----	53 d.
450.--2, 4, 5-TRICHLOROPHENOXYACETIC ACID 								
Drill and Hiratzka, 1953	11 dogs	Mongrel	M&F	2, 5, 10 or 20 mg. per kg. in capsules, 5 d. per wk.	P.O.	0	7 alive	13 wks.
451.--TRI-o-CRESYL PHOSPHATE 								
Hove, 1953	Rats	Albino	M	0.1% in the diet. Various concentrations of Vitamin A.	P.O.	0	----	12 wks.

[442] 7 with keratinizing papillomatous change.

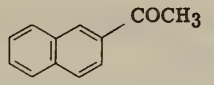
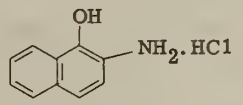
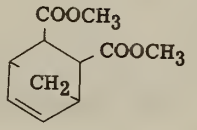
[443] 46 testicular tumors, 12 hepatomas.

Reference	Animal	Strain or type	Sex	Preparation and dose	Site and route	Animals with tumors	Survival	Duration of experiment
452. -- 2, 4, 6-TRINITROTOLUENE 								
Masturzo, 1949	6 rabbits	----	----	2 mg. in aqueous suspension every 48 hrs.	P.O.	0[442a]	100% alive	60 d.
Shils and Goldwater, 1950	Rats	----	----	150 or 300 mg. % of the diet (Various diets)	P.O.	0	----	90 d.
Zambrano, 1950	6 rabbits	----	----	20 mg. per wk.	P.O.	0[442a]	----	35 d.
	10 rabbits	----	----	20 mg. per wk. for 6 wks.	P.O.	0[442a]	7 died by 6 wks.	At least 6 wks.
453. --TRIPHENYLETHYLENE $(C_6H_5)_2C{=}CHC_6H_5$								
Armstrong and Bonser, 1948	20 mice	A	M, castr.	3 mg. in arachis oil once weekly	S.C.	Tumors[444]	----	At least 60 wks.
	23 mice	A	M	3 mg. in arachis oil once weekly	S.C.	Tumors[445]	----	At least 60 wks.
Muñiz and Dominguez, 1949	6 rats	----	----	Range from 0.005 to 0.02 gm. daily	S.C.	0	----	Up to 3 mos.
454. --TYROSINE 								
Muñiz and Dominguez, 1949	6 rats	----	----	Range from 0.005 to 0.02 gm. daily	S.C.	0	----	Up to 3 mos.
455. --VITAMIN A 								
Fraser, 1949	2 mice	----	----	1250 I.U. every other day, increased to 4000 I.U. every other day at 6 mos.	P.O.	0	----	At least 7 mos.
	2 mice	----	----	1250 I.U. every other day for 2 months, plus 1 mg. of vitamin C in aqueous soln.	P.O.	0	----	At least 2 mos.
Masin, 1950	6 rats	Sprague-Dawley	F	2000 I.U. for 36 d. dissolved in a soln. of "Tween 20"	S.C.	0[442a]	----	At least 36 d.

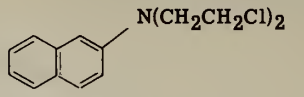
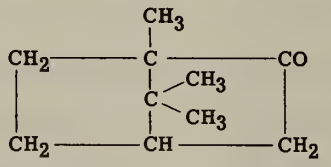
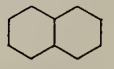
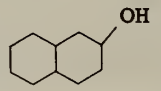
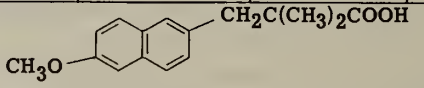
[442a] No pathology reported.
[444] 2 mammary tumors.
[445] 21 testicular tumors, 2 adenomas, 19 interstitial cell carcinomas.

Reference	Animal	Strain or type	Sex	Preparation and dose	Site and route	Animals with tumors	Survival	Duration of experiment
				456.--XYLIDINE[446] 				
Treon et al., 1949a	2 rabbits	----	----	0.14 ml. per kg., 7 d. per wk. for 8 wk.	P.O.	0	----	8 wks.
	6 rabbits	----	----	0.12 - 0.62 g. per kg.	P.O.	0	----	2 mos.
Treon et al., 1950	2 cats	----	----	7.8 p.p.m., 92 seven hr. exposures	Inhalation	0	100% alive	Over 18.5 wks.
	2 cats	----	----	17.4 p.p.m., 31 seven hr. exposures	Inhalation	0	Both died by 6.5 wks.	6.5 wks.
	2 rats	----	----	17.4 p.p.m., 7 seven hr. exposures	Inhalation	0	100% alive	Over 14 wks.
	5 rats	----	----	60 p.p.m., 50 seven hr. exposures	Inhalation	0	3 died	Over 10 wks.
	1 guinea pig	----	----	17.4 p.p.m., 70 seven hr. exposures	Inhalation	0	----	Over 14 wks.
	2 guinea pigs	----	----	50 p.p.m., 55 seven hr. exposures	Inhalation	0	1 died	Over 10 wks.
	2 guinea pigs	----	----	60 p.p.m., 50 seven hr. exposures	Inhalation	0	1 died	Over 10 wks.
	4 rats	----	----	132 - 142 p.p.m., 50 seven hr. exposures	Inhalation	0	2 died	Over 10 wks.
	2 guinea pigs	----	----	132 - 142 p.p.m., up to 25 seven hr. exposures	Inhalation	0	1 died at 2 wks.	5 wks.
	2 rabbits	----	----	17.4 p.p.m., 70 seven hr. exposures	Inhalation	0	100% alive	Over 14 wks.
	4 rabbits	----	----	50 p.p.m., 60 seven hr. exposures	Inhalation	0	100% alive	Over 12 wks.
	4 rabbits	----	----	60 p.p.m., 50 seven hr. exposures	Inhalation	0	1 died	Over 10 wks.
	6 rabbits	----	----	132 - 142 p.p.m., 50 seven hr. exposures	Inhalation	0	100% alive	Over 10 wks.
	1 monkey	----	----	7.8 p.p.m., 92 seven hr. exposures	Inhalation	0	----	Over 18.5 wks.
	12 rabbits	----	----	2 - 50% in iso-octane	Skin	0	Several died early	50 d.

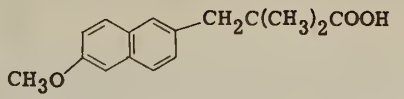
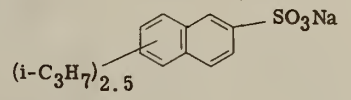
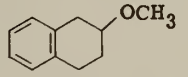
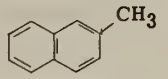
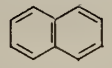
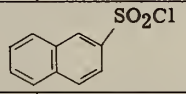
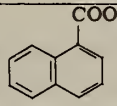
[446] Mixture of isomers.

Reference	Animal	Strain or type	Sex	Preparation and dose	Site and route	Animals with tumors	Survival	Duration of experiment
457. --β-ACETONAPHTHONE 								
Fitzhugh and Buschke, 1949	5 rats	----	----	2% in the diet	P.O.	0	----	Over 2 mos.
458. --2-AMINO-1-NAPHTHOL HYDROCHLORIDE 								
Boyland and Sargent, 1951	5 mice	B	----	10 mg. per ml. in arachis oil, 0.05 ml. of soln. in 20 sites	Intradermal	0	----	At least 120 d.
Bonser et al., 1951	3 mice	Stock	F	10 mg. pellets of paraffin wax containing 30%.	Bladder implant.	Tumors[446a]	----	34 wks.
Bonser et al., 1952	14 rats	Stock	M&F	5 mg. per 100 gm. body wt. in arachis oil once every 2 wks. until death	S.C.	5 sarc.	6 alive at 80 wks.	Over 80 wks.
	8 mice	R III	M&F	5 mg. per 100 gm. body wt. in arachis oil once every 2 wks. for 29 wks.	S.C.	1 sarc.[447]	6 died by 40 wks.	70 wks.
	15 mice	Stock	M&F	5 mg. per 100 gm. body wt. in arachis oil once every 2 wks. for 65 wks.	S.C.	2 sarc.[448]	15 alive at 50 wks.	Over 70 wks.
	14 mice	White	----	10 to 14% in 10 to 20 mg. pellets of paraffin wax; sutured into urinary bladder	Implantation	Tumors[449]	8 alive at 30 to 39 wks.	40 wks.
Bonser et al., 1953	8 rats	Piebald	M&F	80 - 177 mg. pellets in paraffin wax. Implanted in bladder mucosa	Implantation	0[450]	5 alive over 50 wks.	69 wks.
459. --cis-BICYCLO (2, 2, 1-HEPTENE-2, 3-DICARBOXYLIC ACID) METHYL ESTER 								
Draize et al., 1948	50 rats	----	----	Undiluted, daily	Skin	0	----	90 d.
	60 mice	----	----	Undiluted, daily	Skin	0	----	90 d.

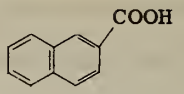
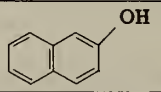
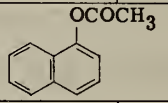
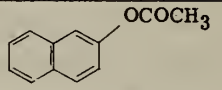
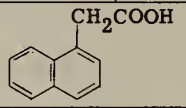
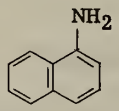
[446a] 1 papilloma and 1 carcinoma.
[447] Also 1 leukemia.
[448] Also 4 hepatomas and 3 leukemias.
[449] 5 carcinomas of bladder, 1 papilloma of bladder.
[450] 5 papillomas of bladder epithelium (paraffin wax controls developed 7/8 papillomas).

Reference	Animal	Strain or type	Sex	Preparation and dose	Site and route	Animals with tumors	Survival	Duration of experiment
460. --BIS(2-CHLOROETHYL)-β-NAPHTHYLAMINE 								
Boyland and Sargent, 1951	5 mice	C57	----	75.0 mg. per ml. in arachis oil, 0.05 ml. of soln. in 1, 2 or 4 sites	Intradermal	0	----	----
Rosti and Zangaglia, 1953	Rabbits	----	----	5 mg. per kg. body wt. for about 1 mo.	----	0	----	30 d.
Salaman and Roe, 1953	16 mice	Stock albino "S"	F	0.06 to 12 mg. in acetone, 2 applications followed by 0.5% croton oil in acetone weekly.	Skin	0[450a]	11 alive at 16 wks.	33 wks.
461. --CAMPHOR 								
Ezeyza, 1952a	30 rats	White	M&F	Once monthly, injection bleb with diameter of 3 mm.	S.C.	0	5 alive at 18 mos.	18 mos.
462. --DECAHYDRONAPHTHALENE 								
Fitzhugh and Buschke, 1949	5 rats	----	----	2% in the diet	P.O.	0	----	Over 2 mos.
463. --trans-β-DECALOL 								
Fitzhugh and Buschke, 1949	5 rats	----	----	2% in the diet	P.O.	0	----	Over 2 mos.
464. --DIMETHYL ETHYL ALLENOLIC ACID METHYL ETHER 								
Rudali, 1952	20 mice	R3A	M	Twice weekly, 0.1 ml. 0.05% oil soln., 5 μg. then 0.2 ml. of same, 10 μg. for 7 wks.	P.O.[23]	3[453]	15 alive at 90 d.	At least 90 d.
	6 mice[453a]	R3A	M	Twice weekly, 0.1 ml. 0.05% oil soln., 5 μg. then 0.2 ml. of same, 10 μg. for 7 wks.	P.O.[23]	0	4 alive	12 mos.
	9 mice	R3P	M	Twice weekly, 0.1 ml. 0.05% oil soln., 5 μg. then 0.2 ml. of same, 10 μg. for 7 wks.	P.O.[23]	0	6 alive	13 mos.

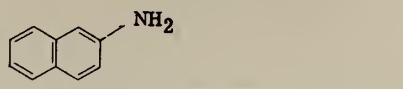
[23] Stomach tube
[450a] 1 papilloma at 16 wks.
[453] Mammary adenocarcinomas at 5.5, 6.5 and 7 months.
[453a] Nursed by R3P mothers.

Reference	Animal	Strain or type	Sex	Preparation and dose	Site and route	Animals with tumors	Survival	Duration of experiment
464. --DIMETHYL ETHYL ALLENOLIC ACID METHYL ETHER--Continued 								
Rudali, 1952	8 mice[454]	R3P	M	Twice weekly, 0.1 ml. 0.05% oil soln., 5 μg. then 0.2 ml. of same, 10 μg. for 7 wks.	P.O.[23]	1[455]	4 alive	12 mos.
465. --ISOPROPYLNAPHTHALENE SODIUM SULFONATE[455a] 								
Hopper et al., 1949	10 mice	Harlan	M&F	0.19 gm. per kg. daily, 6 d. per wk.	P.O.	0	7 died	30 d.
466. --2-METHOXY-1, 2, 3, 4-TETRAHYDRONAPHTHALENE 								
Fitzhugh and Buschke, 1949	5 rats	----	----	2% in the diet	P.O.	0[456]	----	Over 2 mos.
467. --β-METHYLNAPHTHYLENE 								
Fitzhugh and Buschke, 1949	5 rats	----	----	2% in the diet	P.O.	0	----	Over 2 mos.
468. --NAPHTHALENE 								
Fitzhugh and Buschke, 1949	5 rats	----	----	2% in the diet	P.O.	0[456]	----	Over 2 mos.
Schmahl and Reiter (unpub. data)	28 rats	BD I	----	10 mg. daily (total dose 10 g.)	P.O.	0	19 alive at 1 yr.	33 mos.
469. --NAPHTHALENE-β-SULFONYL CHLORIDE 								
Fitzhugh and Buschke, 1949	5 rats	----	----	2% in the diet	P.O.	0	----	Over 2 mos.
470. --α-NAPHTHOIC ACID 								
Fitzhugh and Buschke, 1949	5 rats	----	----	2% in the diet	P.O.	0	----	Over 2 mos.

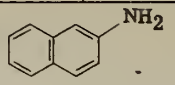
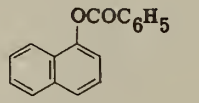
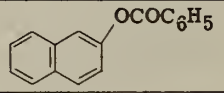
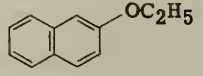
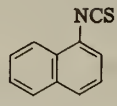
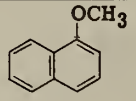
[23] Stomach tube.
[454] Nursed by R3A mothers (16-25 days old).
[455] 1 mammary adenocarcinoma at 10 months.
[455a] Aerosol O.S. Formula supplied by manufacturer.
[456] Cataracts induced.

Reference	Animal	Strain or type	Sex	Preparation and dose	Site and route	Animals with tumors	Survival	Duration of experiment
471. --β-NAPHTHOIC ACID 								
Fitzhugh and Buschke, 1949	5 rats	----	----	2% in the diet	P.O.	0	----	Over 2 mos.
472. --β-NAPHTHOL 								
Fitzhugh and Buschke, 1949	5 rats	----	----	2% in the diet	P.O.	0[456]	----	Over 2 mos.
473. --α-NAPHTHYL ACETATE 								
Fitzhugh and Buschke, 1949	5 rats	----	----	2% in the diet	P.O.	0	----	Over 2 mos.
474. --β-NAPHTHYL ACETATE 								
Fitzhugh and Buschke, 1949	5 rats	----	----	2% in the diet	P.O.	0	----	Over 2 mos.
475. --1-NAPHTHYLACETIC ACID 								
Truhaut and Vermes, 1949	50 mice	----	M&F	0.5 ml. aqueous soln. 0.01% 6 times for 6 wks. (total dose 300 μg.)	S.C.	0	----	21 mos.
	50 mice	----	M&F	0.5 ml. (olive oil soln. 0.1%) 6 times in 6 wks. (total dose 3 mg.)	S.C.	0	----	21 mos.
476. --α-NAPHTHYLAMINE 								
Fitzhugh and Buschke, 1949	5 rats	----	----	2% in the diet	P.O.	0	----	Over 2 mos.
Genrmann et al., 1949	2 dogs	----	----	330 mg. daily (technical)	P.O.	0	----	4.5 yrs.
	3 dogs	----	----	301 mg. daily (pure)	P.O.	0	----	4.5 yrs.

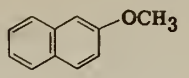
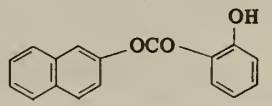
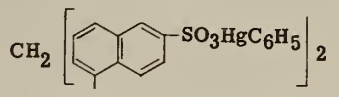
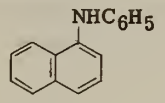
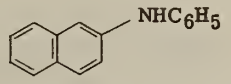
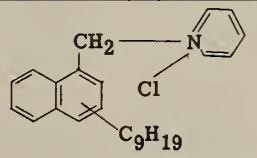
[456] Cataracts induced.

Reference	Animal	Strain or type	Sex	Preparation and dose	Site and route	Animals with tumors	Survival	Duration of experiment
477.--β-NAPHTHYLAMINE 								
Fitzhugh and Buschke, 1949	5 rats	----	----	2% in the diet	P.O.	0	----	Over 2 mos.
Gehrmann et al., 1949	4 dogs	----	----	300 mg. daily for at least 50 d.	P.O.	Tumors	----	At least 50 d.
Hackmann, 1951b	20 mice	S.W.	----	0.5 ml. of a 0.4% soln. in olive oil, (= 2 mg.) (99.1% pure)	S.C.	3 sarc.	9 alive at 14 mos., 11 at 23 wks.	14 mos.
	20 mice	S.W.	----	0.5 ml. of a 0.1% soln. in olive oil, (= 0.5 mg.)	S.C.	0	8 alive over 14 mos.	14 mos.
	8 hamsters	Golden	----	2 inj. of 2.0 ml. each of a 1% suspension in water (=2 x 20 mg.) during a three mo. period	S.C.	0	7 alive at 6 mos. 2 alive at 12 mos.	At least 12 mos.
Patellani et al., 1951	12 mice	IV B	M	Aqueous suspension, 3000 μg. in 0.1 ml., weekly for 22 wks.	P.O.	1[457]	----	At least 22 wks.
	22 mice	IV B and L	M	Aqueous suspension, 69 μg. in 0.1 ml., weekly for 22 wks.	P.O.	2[458]	----	14 mos.
	22 mice	IV B and L	M	Aqueous suspension, 69 μg. in 0.1 ml. weekly for 22 wks.	S.C.	1[458]	----	At least 22 wks.
	13 mice	IV B and L	M	3% in oil, 564 μg. a wk. for 28 wks.	P.O.	2[459]	----	1 yr.
Allison et al., 1952	Dogs	----	----	400 mg. per day. Pantothenate added to the diet	P.O.	0	----	6 mos.
Bonser et al., 1952	6 rabbits	----	M&F	200 mg. twice per week (powdered)	P.O.	Tumors[460]	----	5.25 yrs.
	50 rats	Albino	M&F	310 mg. per kg. body wt. in the diet per wk.	P.O.	Tumors[461]	44 alive at 30 wks.	Over 90 wks.
	111 mice	CBA	M&F	160 mg. per kg. body wt. in the diet per wk. Various levels of protein in the diet	P.O.	Tumors[462]	108 alive at 40 wks.	89 wks.
	8 mice	White	----	10 to 15% in 10 to 20 mg. pellet of paraffin wax. Sutured in urinary bladder.	Implantation	0	7 alive at 39 wks.	40 wks.
	25 mice	IF	M&F	Saturated soln. in benzene once weekly for 99 wks.	----	0	15 alive at 99 wks.	99 wks.
	23 mice	DBA	M&F	5 mg. in arachis oil twice weekly	P.O.[23]	Tumors[463]	23 alive at 39 wks.	89 wks.
	25 mice	IF	M&F	5 mg. in arachis oil twice weekly	P.O.[23]	Tumors[464]	23 alive at 30 wks.	72 wks.

[23] Stomach tube.
[457] Lung adenocarcinoma.
[458] 1 lung adenocarcinoma, 1 reticulo-histiocytoma.
[459] 7 tumors: 4 lung adenocarcinomas, 3 reticulo-histiocytomas.
[460] 1 transitional cell papilloma of bladder at 4.75 years.
[461] 4 bladder papillomas.
[462] 49 hepatomas (16 malignant).
[463] 13 hepatomas.
[464] 10 cholangiomas.

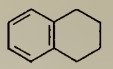
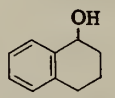
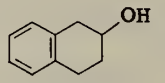
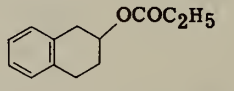
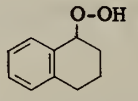
Reference	Animal	Strain or type	Sex	Preparation and dose	Site and route	Animals with tumors	Survival	Duration of experiment
477. --β-NAPHTHYLAMINE--Continued 								
Mellors and Hlinka, 1952	Dogs	Mongrel	F	150-500 mg. daily in the diet	P.O.	0[465]	----	6 mos.
Bonser et al., 1953	5 rats	Piebald	M&F	111 - 162 mg. pellets in paraffin wax implanted in bladder mucosa	Implantation	0	----	56 wks.
Leathem and Allison, 1953	8 dogs	----	M&F	----	P.O.	0[466a]	----	6 mos.
478. --α-NAPHTHYL BENZOATE 								
Fitzhugh and Buschke, 1949	5 rats	----	----	2% in the diet	P.O.	0	----	Over 2 mos.
479. --β-NAPHTHYL BENZOATE 								
Fitzhugh and Buschke, 1949	5 rats	----	----	2% in the diet	P.O.	0	----	Over 2 mos.
480. --β-NAPHTHYL ETHYL ETHER 								
Fitzhugh and Buschke, 1949	5 rats	----	----	2% in the diet	P.O.	0[466]	----	Over 2 mos.
481. --α-NAPHTHYL ISOTHIOCYANATE 								
Mazzanti and Lopez, 1952	24 rats	Albino	----	25-50 mg. per kg. body wt. every other day. 12 rats had gum arabic in the diet and 12 had olive oil.	S.C.	0[442a]	----	42 d.
	12 rats	Albino	----	25 mg. per kg. body wt. every other day. 6 rats had gum arabic in the diet and 6 had olive oil.	P.O.	0[442a]	----	42 d.
482. --α-NAPHTHYL METHYL ETHER 								
Fitzhugh and Buschke, 1949	5 rats	----	----	2% in the diet	P.O.	0	----	Over 2 mos.

[442a] No pathology reported.
[465] Fluorescence study of bladder epithelium.
[466] Cataracts induced.
[466a] No details, an abstract.

Reference	Animal	Strain or type	Sex	Preparation and dose	Site and route	Animals with tumors	Survival	Duration of experiment
483. --β-NAPHTHYL METHYL ETHER 								
Fitzhugh and Buschke, 1949	5 rats	----	----	2% in the diet	P.O.	0[466]	----	Over 2 mos.
484. --β-NAPHTHYL SALICYLATE 								
Fitzhugh and Buschke, 1949	5 rats	----	----	2% in the diet	P.O.	0[466]	----	Over 2 mos.
485. --PHENYLMERCURIC DINAPHTHYLMETHANE DISULPHONATE 								
Goldberg et al., 1950	12 guinea pigs	----	----	5 - 50 mg. per kg. in the diet, single dose	P.O.	0	1 killed	3 mos.
486. --PHENYL α-NAPHTHYLAMINE 								
Gehrmann et al., 1949	3 dogs	----	----	290 mg. daily	P.O.	0	----	3 yrs.
487. --PHENYL β-NAPHTHYLAMINE 								
Gehrmann et al., 1949	3 dogs	----	----	540 mg. daily	P.O.	0	----	4.5 yrs.
488. --POLYALKYL NAPHTHALENE PYRIDINIUM CHLORIDE[467] 								
Hopper et al., 1949	10 mice	Harlan	M&F	0.047 gm. per kg. daily, 6 days per wk.	P.O.	0	7 died	30 d.

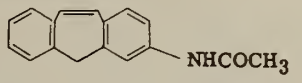
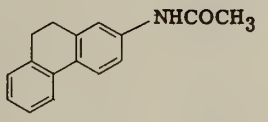
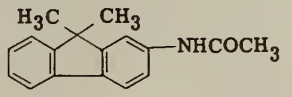
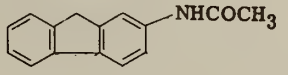
[466] Cataracts induced.

[467] Emcol 888.

Reference	Animal	Strain or type	Sex	Preparation and dose	Site and route	Animals with tumors	Survival	Duration of experiment
489.--TETRAHYDRONAPHTHALENE 								
Fitzhugh and Buschke, 1949	5 rats	----	----	2% in the diet	P.O.	0	----	Over 2 mos.
490.--1, 2, 3, 4-TETRAHYDRO-α-NAPHTHOL 								
Fitzhugh and Buschke, 1949	5 rats	----	----	2% in the diet	P.O.	0	----	Over 2 mos.
491.--1, 2, 3, 4-TETRAHYDRO-β-NAPHTHOL 								
Draize et al., 1948	60 mice	----	----	Undiluted, daily	Skin	0	----	90 d.
	50 rats	----	----	Undiluted, daily	Skin	0	----	90 d.
	30 guinea pigs	----	----	Undiluted, daily	Skin	0	----	90 d.
	50 rabbits	----	----	Undiluted, daily	Skin	0	----	90 d.
Fitzhugh and Buschke, 1949	200 rats	----	----	0.125-0.2% in the diet	P.O.	0[468]	----	6 mos.
492.--1, 2, 3, 4-TETRAHYDRO-2-NAPHTHYL PROPIONATE 								
Fitzhugh and Buschke, 1949	5 rats	----	----	2% in the diet	P.O.	0[466]	0	Over 2 mos.
493.--TETRALIN HYDROPEROXIDE 								
Boyland and Sargent, 1951	7 mice	B	----	0.36 molar in arachis oil, 0.05 ml. in 7 sites	Intradermal	0	----	----

[466] Cataracts induced.

[468] Cataracts in the eyes of all rats fed 0.25% or more.

Reference	Animal	Strain or type	Sex	Preparation and dose	Site and route	Animals with tumors	Survival	Duration of experiment
494. --2'-ACETYLAMINO-2, 3, 6, 7-DIBENZOTROPILIDENE 								
Schinz et al., 1955	5 rats	----	F	23 mg. per day, 0.1% in food for 40 d. (total dose 900 mg.)	P.O.	0	----	462 d.
495. --2-ACETYLAMINO-9, 10-DIHYDROPHENANTHRENE 								
Miller et al., 1955	9 rats	Holtzman	M	1.62 m.mols per kg. of diet for 8 mos.	P.O.	Tumors[469]	2 neg. dead	At least 8 mos.
	9 rats	Holtzman	F	1.62 m.mols per kg. of diet for 8 mos.	P.O.	Tumors[471]	----	At least 8 mos.
496. --2-ACETYLAMINO-9, 9-DIMETHYLFLUORENE 								
Schinz, et al., 1955	10 rats	----	M	13 mg. per day, 0.1% in the food for 70 d., (total dose 900 mg.)	P.O.	0	Alive at 689 d.	823 d.
497. --2-ACETYLAMINOFLUORENE 								
Harris, 1947	75 rats	Wistar	M&F	0.04% in diet	P.O.	Tumors[472]	----	At least 300 d.
Stasney et al., 1947	80 rats	Sherman	M&F	0.03% in diet up to 375 d.	P.O.	Tumors[473]	----	400 d.
Cantarow et al., 1948	79 rats	Sherman & Wistar	M	0.03% in the diet for up to 400 d.	P.O.	Tumors[474]	----	400 d.
	57 rats	Sherman & Wistar	F	0.03% in the diet for up to 400 d.	P.O.	17[475]	----	400 d.

[469] 4 ear duct tumors at 10 months, 4 small intestine tumors at 10 months, 1 partially differentiated ganglioneuroma (ganglioneuroblastoma) at base of brain, found at 10 months.

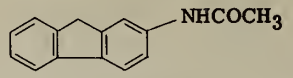
[471] Mammary gland tumors; 5 at 5 months, 9 at 8 months, 9 at 10 months; small intestine tumors: 2 at 6 months, 5 at 10 months; 1 endometrial sarcoma of uterus found at 5 months.

[472] Of the liver; also acoustic duct tumors, mammary tumors, bladder tumors, etc.

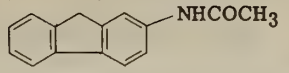
[473] Hepatomas and cholangiomas of liver in 37 animals; 10 with mammary adenocarcinoma; 2 with bladder carcinomas.

[474] Only recorded mammary tumors.

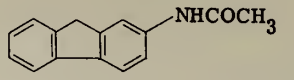
[475] Mammary cancers.

Reference	Animal	Strain or type	Sex	Preparation and dose	Site and route	Animals with tumors	Survival	Duration of experiment
497. --2-ACETYLAMINOFLUORENE--Continued 								
Engel and Copeland, 1948	25 rats	Piebald (AES)	F	0.3% in the diet	P.O.	Tumors[476]	24 alive at 3 mos.	At least 181 d.
Morris et al., 1948b	1 rat	----	----	2.7 mg. per 100 gm. body wt., 6 times weekly for 18 wks.	P.O.	Tumors[477]	Alive at 25 wks.	35 wks.
Morris et al., 1948a	Rats	Buffalo	----	0.25 mg. per 100 gm. per wk. for 18 wks. in the diet	P.O.[23]	Tumors[478]	----	Over 18 wks.
	108 rats	Buffalo	----	1 mg. per 100 gm. per wk. for 18 wks. in the diet	P.O.[23]	6[479]	----	Over 18 wks.
	99 rats	Buffalo	----	4 mg. per 100 gm. per wk. for 18 wks. in the diet	P.O.[23]	32[479]	----	Over 18 wks.
	73 rats	Buffalo	----	16 mg. per 100 gm. per wk. for 18 wks. in the diet	P.O.[23]	34[479]	----	Over 18 wks.
	30 rats	----	----	0.5% in the diet	P.O.	19[479]	----	----
	Rats	----	----	In acetone 3 times a wk. (total 0.5 - 1 mg. per wk.)	Skin	Tumors[480]	----	----
Paschkis et al., 1948	54 rats	Sherman & Wistar	F	0.03% in the diet throughout	P.O.	Tumors[481]	----	120 to 375 d.
	55 rats	Sherman & Wistar	M	0.03% in the diet throughout	P.O.	Tumors[482]	----	133 to 333 d.
Bielschowsky, 1949a	5 rats[483]	----	F	4 mg. in the diet daily for 25 wks.	P.O.	2[484]	----	54 wks.
	5 rats[486]	----	M	4 mg. in the diet daily for 8 wks., 2 mg. for 5 wks.	P.O.	2[484]	----	42 wks.
Bielschowsky, 1949b	25 rats	Wistar and Piebald	M	In acetone	Skin	Tumors[485]	----	----
Engel and Copeland, 1949a	12 rats	AES	F	0.3% in the diet, 3 - 5 months.	P.O.	Tumors[487]	----	5 mos.
Engel and Copeland, 1949b	Rats	AES	F	0.03% in the diet	P.O.	Tumors[488]	----	----
Griffin et al., 1949b	Rats	Sprague-Dawley	M	0.04% in the diet for 24 wks.	P.O.	Tumors[489]	----	28 wks.

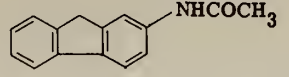
[23] Stomach tube.
[476] 100% mammary tumors; also 1 rat with an external auditory canal carcinoma.
[477] 1 mammary carcinoma, 1 carcinoma of uterus, and a precancerous hyperkeratosis of the external ear duct (transplanted).
[478] Approximately 5%, type not specified.
[479] Type not stated.
[480] 11 total in 8 rats
[481] 19 hepatic carcinomas, 17 other carcinomas (not specified).
[482] 46 hepatic carcinomas, 7 other carcinomas.
[483] Partially thyroidectomized at 6th week of the experiment.
[484] Thyroid adenomas.
[485] 15 hepatomas. Also carcinoma of intestine in 4 of the 20 Piebald rats.
[486] Partially thyroidectomized at 8th week of the experiment.
[487] 100% mammary carcinoma.
[488] Mammary.
[489] Liver tumors at 24 weeks.

Reference	Animal	Strain or type	Sex	Preparation and dose	Site and route	Animals with tumors	Survival	Duration of experiment
497. --2-ACETYLAMINOFLUORENE--Continued 								
Leathem, 1949	Mice	Swiss	F	0.1% in food	P.O.	0	Killed at 45 or 106 d.	106 d.
Miller et al., 1949	12 rats	Albino	M&F	0.040% in the diet for 8 to 11 mos.	P.O.	Tumors[490]	----	11 mos.
	20 rats	Albino	M&F	0.036% in the diet for 8 mos.	P.O.	Tumors[491]	19 alive at 4 mos.	8 mos.
Stasney et al., 1949	Rats	----	----	0.03% in the diet for 120 d. Some had bone marrow ablation	P.O.	Tumors[492]	----	300 d.
Strömbeck and Ekman, 1949	8 pairs of rats[493]	Taby	----	0.031% in a complete diet for 2 wks.	P.O.	0	Alive 139 to 354 d.	354 d.
	5 rats	White	F	0.031% in the diet. Rice diet with 10 g. carrots per wk.	P.O.	Tumors[492]	----	162 d.
	5 rats	White	F	0.016% in the diet. Rice diet with 10 g. carrots per wk.	P.O.	1[494]	----	162 d.
	5 rats	White	F	0.031% in a complete diet	P.O.	Tumors[492]	----	162 d.
	5 rats	White	F	0.016% in a complete diet	P.O.	0	----	162 d.
Allison et al., 1950	12 dogs	Beagles and mongrels	M	0.03% in synthetic diet	P.O.	Tumors[495]	----	9 mos.
Bielschowsky and Griesbach, 1950	4 rats	Wistar	F	4 mg. in the diet daily	P.O.	0[495a]	----	10 wks.
Bonser and Green, 1950	6 rabbits	Stock	M&F	100 mg. weekly. Total dose 21 - 52 g., powder orally (spoon)	P.O.	4[496]	----	5 yrs.
	2 rabbits	Dutch	M	50 mg. daily. Total dose 16.2 - 14.0 g., in the diet	P.O.	1[497]	----	1.5 yrs.
Breedis, 1950	Salamander	Triturus viridescens	----	1 injection	S.C.	0	----	----
Copeland and Engel, 1950	19 rats	----	F	0.03% in the diet	P.O.	6[498]	----	300 d.
Doniach, 1950	14 rats	Lister hooded	M&F	1 mg. per 10 ml. of a 0.75% gum-acacia soln. in tap water for 5 to 15 mo.	P.O.	7[499]	10 alive at 14 mos.	15 mos.
Dunning et al., 1950a	Rats	Fischer	F	0.06 in the diet	P.O.	Tumors[504]	51 alive at minimum latent period.	----
Dunning et al., 1950c	27 rats	Fischer 344	F	0.06% in the diet, 26% casein.	P.O.	Tumors[500]	16 alive at 100 d.	283 d. avg.

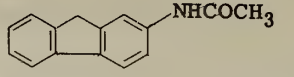
[490] 3 ear duct tumors, 4 hepatomas, 1 lung tumor.
[491] 7 mammary carcinomas, 10 ear duct tumors, 7 hepatomas.
[492] Hepatomas.
[493] Parabiotic with the left partner bilaterally nephrectomized.
[494] Benign hepatoma.
[495] 3 hepatomas.
[495a] Only thyroid pathology studied.
[496] Adenocarcinomas and papillomas of urinary bladder and ureters.
[497] Ureteric adenocarcinoma.
[498] Eye tumors.
[499] Thyroid adenomas.
[500] 6 hepatomas, 3 with metastasis; 3 ear duct carcinomas.
[504] 34 hepatomas, 22 bladder carcinomas, 5 ear duct tumors, external.

Reference	Animal	Strain or type	Sex	Preparation and dose	Site and route	Animals with tumors	Survival	Duration of experiment
497. --2-ACETYLAMINOFLUORENE--Continued 								
Dunning et al., 1950c	13 rats	Fischer 344	F	0.06% in the diet, 4.3% Tryptophan	P.O.	Tumors[501]	12 alive at 100 d.	320 d. avg.
	12 rats	Fischer 344	F	0.06% in the diet, 1.4% Tryptophan	P.O.	Tumors[502]	11 alive at 100 d.	400 d. avg.
	13 rats	Fischer 344	F	0.06% in the diet, 45% casein, Tryptophan free	P.O.	Tumors[503]	12 alive at 100 d.	303 d. avg.
Engel, 1950	Rats	AES	F	0.03% in the diet (Various diets)	P.O.	Tumors[505]	----	40 wks.
Hoch-Ligeti and Russell, 1950	50 rats	Wistar	M&F	0.07% in the diet	P.O.	Tumors[506]	----	----
Horning, 1950	31 mice	A	M&F	Crystals plus a graft of lung tissue	S.C.	Tumors[507]	----	Over 12 wks.
Leathem and Barken, 1950	11 rats	----	M	0.03% in the diet	P.O.	Tumors[508]	----	8 mos.
Morris et al., 1950a	20 rats	Buffalo	M&F	0.05% in the diet for 23 wks. (580 mg. per rat)	P.O.	12[509]	----	----
	9 rats	Minnesota and Wistar	M&F	2% in acetone 3 times weekly (58 mg. per rat)	Skin	7[510]	----	At least 497 d.
Stasney et al., 1950	9 rats[511]	Wistar and Sherman	M	0.03% in the diet for 106 d.	P.O.	Tumors[512]	----	106 d.
	19 rats[513]	Wistar and Sherman	M	0.03% in the diet for 120 d.	P.O.	Tumors[514]	----	350 d.
	86 rats	Wistar and Sherman	M	0.03% in the diet for 120 d.	P.O.	Tumors[515]	----	350 d.
Wase and Allison, 1950	24 rats	Long-Evans	M	0.03% in the diet for 8 wks. Various amounts of riboflavin added	P.O.	0	----	8 wks.
Wilson and DeEds, 1950	20 rats	----	F	0.062 and 0.125% in the diet (Various diets)	P.O.	Tumors[516]	----	445 d.

[501] 9 hepatomas, 7 with metastases; 11 bladder carcinomas.
[502] 8 hepatomas, 7 with metastases; 11 bladder carcinomas; 2 ear duct carcinomas.
[503] 11 hepatomas, 8 with metastases.
[505] Mammary, hepatomas and eye tumors.
[506] 50% of females and 81% of males with hepatomas. 3 cerebral tumors (1 unclassified glioma, 1 oligodendroglioma, 1 meningioma). Also 1 uterine fibromyoma noted.
[507] 12 pulmonary adenomas in the graft.
[508] 50% hepatomas.
[509] 9 hepatomas, 5 mammary carcinomas, 7 ear duct carcinomas, 1 kidney squamous cell carcinoma, 1 bladder squamous cell carcinoma.
[510] 1 cholangioma, 5 mammary carcinomas, 1 mammary sarcoma, 1 ear duct carcinoma, 1 thymus lymphoma, 1 intestinal reticulum cell sarcoma.
[511] Ablation of bone marrow and splenectomy.
[512] 6 hepatomas.
[513] With an ablation of bone marrow.
[514] 100%
[515] 60% hepatomas.
[516] Hepatomas; bladder, uterus and head tumors, varying with diet alterations.

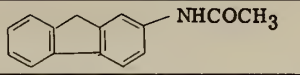
Reference	Animal	Strain or type	Sex	Preparation and dose	Site and route	Animals with tumors	Survival	Duration of experiment
497.--2-ACETYLAMINOFLUORENE--Continued 								
Bielschowsky and Hall, 1951a	Rats[517]	Albino from Wistar stock	M	4 mg. in 1 cc. peanut oil, 3 times weekly, 17 - 38 doses	P.O.[23]	Tumors[518]	----	59 wks.
	Rats[517]	Albino from Wistar stock	M	0.03% in the diet to both partners for 4 wks.	P.O.[23]	1[519]	----	41 wks.
	Rats[517]	Albino from Wistar stock	M	6 doses of 20 mg. daily for 6 d.	P.O.[23]	0	----	57 wks.
	15 rats	Albino from Wistar stock	M	4 mg. in 1 cc. of olive oil, 15 or 24 doses	P.O.[23]	Tumors[523]	----	52 wks.
Bielschowsky and Hall, 1951b	Rats[520]	Wistar and Piebald	M&F	4 mg. in 1 cc. of peanut oil, 3 times weekly, total 10-25 doses	P.O.[23]	Tumors[521]	----	43 wks.
	10 rats	Albino	F	4 mg. in 1 cc. of peanut oil 3 times weekly, total 24 doses	P.O.[23]	Tumors[522]	----	52 wks.
Engel, 1951	Rats	----	----	0.03% in the diet (low fat diet)	P.O.	Tumors[524]	----	Over 32 wks.
Engel and Copeland, 1951	108 rats	AES	F	0.03% in the diet (0-30% fat in the diet)	P.O.	Tumors[525]	----	At least 27 wks.
Griffin and Rhein, 1951	Rats	Albino	M	0.04% in the diet, up to 8 mos.	P.O.	Tumors[533]	Sacrificed at intervals	At least 8 mos.
Leathem, 1951	Mice	Swiss	M&F	0.1% in synthetic diet (24% casein and 8% Mazola)	P.O.	Tumors[534]	----	6 mos.
	Mice	Swiss	M&F	0.1% in the diet (fox chow)	P.O.	0	----	6 mos.
	Rats	Wistar	M&F	0.03% in the diet	P.O.	Tumors[535]	----	At least 6 mos.
Paschkis and Cantarow, 1951	9 rats	Wistar	M	0.03% in the diet	P.O.	Tumors[536]	----	409 d.
Paschkis et al., 1951	9 rats	Wistar	M	0.03% in the diet for 90 d.	P.O.	9[537]	Sacrificed at intervals	409 d.
	9 rats	Wistar	M	0.03% in the diet for 310 to 409 d.	P.O.	Tumors[536]	----	409 d.
Skoryna et al., 1951	150 rats	Hooded	M&F	0.05% for 7 wks. followed by 0.04% for 28 wks.	P.O.	80%[538]	124 alive at 6 mos.	20 mos.

[23] Stomach tube.
[517] Parabiotic rats.
[518] 5 hepatic carcinomas, 11 cholangiomas, 3 adenocarcinomas of seminal vesicle.
[519] Adenocarcinoma of seminal vesicle. Benign cholangioma.
[520] 28 parabiotic pairs. Male and female and also female and female combinations. One partner castrated.
[521] 10 granulosa cell tumors of ovary, 2 theca cell tumors of ovary, mammary fibroadenoma, 100% hepatoma.
[522] 3 adenocarcinomas of breast, 1 ear duct tumor, 100% hepatoma.
[523] Benign and malignant hepatomas.
[524] Orbital gland tumors; no further details.
[525] Mammary tumors, ear duct tumors, liver tumors, eye tumors.
[533] Hepatomas; other tumors not specified.
[534] Hepatomas in 10 or 13 male mice.
[535] Hepatomas.
[536] 9 hepatomas and cholangiomas.
[537] Hepatomas and cholangiomas.
[538] In ear duct, liver, breast, lungs, bladder, kidney.

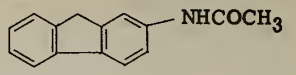
Reference	Animal	Strain or type	Sex	Preparation and dose	Site and route	Animals with tumors	Survival	Duration of experiment
497. --2-ACETYLAMINOFLUORENE--Continued 								
Skoryna et al., 1951	Cats	----	----	40 mg. per day for 6 mos., then 50 mg. per d.	P.O.	Tumors[539]	----	At least 18 mos.
	Rats	Hooded	M&F	In the diet	P.O.	Tumors[540]	126 alive at 6 mos.	At least 6 mos.
Skoryna and Webster, 1951	148 rats	Hooded	M&F	3 - 7.5 mg. daily in the diet for 35 wks.[541]	P.O.	Tumors[542]	35 alive at 12 mos.	At least 12 mos.
	20 rats	Hooded	M	6 - 8 mg. daily in the diet	P.O.	Tumors[543]	5 alive at 7 mos.	7 mos.
Bielschowsky and Bielschowsky, 1952	38 rats	Piebald Sheffield	M&F	4 mg. in the diet daily for 25 wks.	P.O.	Tumors[544]	----	63 wks.
	10 rats	Wistar	----	2 mg. in peanut oil 3 doses per wk., total of 90 doses	P.O.[23]	Tumors[545]	----	52 wks.
Breedis, 1952	Salamander	Triturus viridescens	----	In olive oil 0.02 - 0.005 cc.	S.C.	0	----	----
Cambel and Ray, 1952	Rats	Sprague-Dawley-Holtzman	----	----	Skin	pap.[546]	----	----
Eldredge and Luck, 1952	3 rats	Sprague-Dawley	M	0.04% in the diet for 21 wks.	P.O.	0[546a]	----	21 wks.
Engel and Copeland, 1952a	35 rats	AES	F	300 mg. per kg. in the diet (semi-purified diet)	P.O.	Tumors[547]	----	At least 26 wks.
Engel and Copeland, 1952a	12 rats	Sprague-Dawley	F	300 mg. per kg. in the diet (semi-purified diet)	P.O.	Tumors[549]	----	At least 26 wks.
	29 rats	AES	F	300 mg. per kg. in the diet (stock diet)	P.O.	Tumors[549a]	----	34 or 42 wks.
Engel and Copeland, 1952b	117 rats	AES	F	1.86 - 2.4 gm. per day in the diet[550]	P.O.	9[551]	----	At least 27 wks.
Kobernick et al., 1952	30 rats	Piebald	M	4% in polyethylene glycol 300, 3 times weekly, applied to exteriorized gastric mucosa.	----	0	----	1 yr.
Laws et al., 1952	79 rats	Wistar	M&F	0.05% in the diet	P.O.	Tumors[569]	----	22 wks.
MacDonald et al., 1952	20 rats	Albino	M	0.018% in the diet for 90 d.	P.O.	Tumors[570]	20 alive at 130 d.	220 d.
	16 rats	Albino	M	0.036% in the diet for 90 d.	P.O.	Tumors[571]	16 alive at 180 d.	270 d.

[23] Stomach tube.
[539] 4 with multiple pulmonary tumors, polymorphous sarcoma.
[540] 71 with squamous carcinoma of auditory canal.
[541] Partial hepatectomies on some rats.
[542] 70 with tumors including ear duct carcinomas, mammary tumors, hepatic tumors, and several with metastases.
[543] Cirrhosis and malignant hepatomas.
[544] 20 hepatomas, 30 ear duct carcinomas, 22 intestinal carcinomas, 3 lung tumors (no other details), 1 leukemia, 1 mammary carcinoma, 1 eyelid carcinoma.
[545] 5 hepatomas, 3 ear duct carcinomas, 2 lung tumors, 3 mammary carcinomas.
[546] Of the forestomach.
[546a] No details on tumor incidence.
[547] Mammary tumors, ear duct carcinomas, hepatomas. Average latent period 16 to 23 weeks.
[549] Mammary tumors, 6 ear duct carcinomas, 5 hepatomas. Average latent period 17 to 22 weeks.
[549a] 12 mammary tumors, 16 ear duct carcinomas, 8 hepatomas. Average latent period 20 - 37 weeks.
[550] Different diets and supplements.
[551] Mammary tumors, ear duct tumors, liver tumors.
[569] Hepatomas.
[570] 2 hepatomas, 1 benign cystadenoma.
[571] 13 hepatomas; 3 tumors of ear duct; 7 tumors of small intestine.

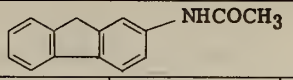
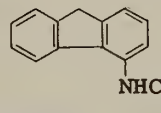
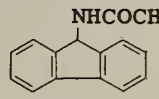
443895

Reference	Animal	Strain or type	Sex	Preparation and dose	Site and route	Animals with tumors	Survival	Duration of experiment
497.--2-ACETYLAMINOFLUORENE--Continued 								
MacDonald et al., 1952	16 rats	Albino	M	0.018% in the diet for 180 d.	P.O.	Tumors[572]	16 alive at 180 d.	270 d.
Morris and Eyestone, 1952	4 dogs	Beagle	----	Average daily intake 7.1 - 8.9 mg. per kg. in the diet (total 32 - 37 gm.)	P.O.	0	----	2.5 yrs.
	1 dog	Beagle	M	9.5 mg. daily average in the diet (total intake 198 gm.)	P.O.	Tumors[573]	----	75.3 mos.
	1 dog	Mongrel	F	8.3 mg. average daily in the diet (total intake 90 gm.)	P.O.	Tumors[574]	----	91.0 mos.
	1 dog	Beagle	M	8.3 mg. daily average in the diet (total intake 192 gm.)	P.O.	Tumors[575]	----	74.3 mos.
	1 dog	Mongrel	F	10.9 mg. average daily in the diet (total intake 105 gm.)	P.O.	Tumors[576]	----	68.5 mos.
	1 dog	Mongrel	M	2.3 mg. average daily in the diet (total intake 45 gm.)	P.O.	0	----	87.2 mos.
Paschkis et al., 1952	Rats	Wistar	----	In the diet for 90 d.	P.O.	Tumors[577]	----	415 d.
Ray et al., 1952	24 rats	Sprague-Dawley-Holtzman	----	0.2 mg. plus 2.5 mg. cortisone acetate plus amyl acetate	Skin	0	24 alive at 6 mos.	At least 12 mos.
	14 rats	Sprague-Dawley-Holtzman	----	0.2 mg. daily in amyl acetate	Skin	0	14 alive at 6 mos.	At least 12 mos.
	12 rats	Sprague-Dawley-Holtzman	----	0.2 mg. daily in amyl acetate, 36 times	Skin	1 pap.[578]	12 alive at 6 mos.	At least 12 mos.
Sandin et al., 1952	25 rats	----	F	1.62 m. mols per kg. in the diet for 8 mos.	P.O.	Tumors[579]	----	10 mos.
	26 rats	----	M	1.62 m. mols per kg. in the diet for 8 mos.	P.O.	Tumors[580]	----	10 mos.
Axelrad and Leblond, 1953	48 rats	Sherman	F	0.03% in the diet for 6 wks. (low in iodine)	P.O.	Tumors[581]	----	1 yr.
Bielschowsky, 1953	63 rats[581a]	Wistar, subline Dunedin	F	4 mg. daily per rat for 9 wks. then 2 mg. daily for 4 wks. (in the diet)	P.O.	27[582]	----	59 wks.
Laird and Miller, 1953	Rats	Albino	M	0.05% for 4 wks. followed by 0.04% for up to 27 wks. in the diet	P.O.	Tumors[583]	----	27 wks.
Leathem and Allison, 1953	Dogs	----	M&F	----	P.O.	0[583a]	----	6 mos.

[572] 12 hepatomas; tumors of small intestine, 3 ear duct tumors, 1 mammary adenocarcinoma.
[573] Hepatic carcinoma with metastases; bladder papillomas.
[574] Hepatic carcinoma, bladder papilloma, adenomas of ovary, adenomas of pancreas.
[575] Hepatic carcinoma; bladder papillomas.
[576] Hepatic carcinoma; bladder papillomas
[577] Hepatomas. No details.
[578] Forestomach.
[579] 21 mammary tumors, 20 ear duct tumors and 5 small intestine tumors.
[580] 22 hepatomas, 13 small intestine tumors and 10 ear duct tumors.
[581] Thyroid tumors in a large percentage of rats after 1 year. (Also in controls with no AAF and only low iodine). Some malignancies.
[581a] 13 spayed rats.
[582] Mammary adenocarcinomas.
[583] Hepatomas.
[583a] No details, an abstract.

Reference	Animal	Strain or type	Sex	Preparation and dose	Site and route	Animals with tumors	Survival	Duration of experiment
497.--2-ACETYLAMINOFLUORENE--Continued 								
Read and McGovern, 1953	11 rats[584]	Wistar	F	Food pellets plus 4 mg. per rat per day, 6 d. per wk. for 9 mos. (in the diet)	P.O.	Tumors[585]	----	9 mos.
	11 rats[585a]	Wistar	F	Food pellets plus 4 mg. per rat per day, 6 d. per wk. for 9 mos. (in the diet)	P.O.	Tumors[586]	----	9 mos.
	11 rats[587]	Wistar	F	Food pellets plus 4 mg. per rat per day, 6 d. per wk. for 9 mos. (in the diet)	P.O.	0[588]	----	9 mos.
	11 rats	Wistar	F, castr.	Food pellets plus 4 mg. per rat per day, 6 d. per wk. for 9 mos. (in the diet)	P.O.	0[589]	----	9 mos.
	11 rats	Wistar	M, castr.	Food pellets plus 4 mg. per rat per day, 6 d. per wk. for 9 mos. (in the diet)	P.O.	Tumors[590]	----	9 mos.
	11 rats[585a]	Wistar	M	Food pellets plus 4 mg. per rat per day, 6 d. per wk. for 9 mos. (in the diet)	P.O.	Tumors[591]	----	9 mos.
Ross et al., 1953	Rats	Hooded	F	0.04% in the diet for 11 mos.	P.O.	Tumors[592]	----	Over 18 mos.
Salaman and Roe, 1953	12 mice	Stock albino "S"	F	Acetone soln. 12 to 48 mg., 2 applications followed by 0.5% croton oil in acetone weekly for 20 wks.	Skin	0	12 alive at 16 wks.	33 wks.
Skoryna and Webster, 1953	Rats	Royal Victoria Hospital	----	0.04% in the diet	P.O.	0[593]	----	----
	Rats	Stanford	----	0.04% in the diet	P.O.	Tumors[594]	----	----
Miller et al., 1955	27 rats	Holtzman	F	1.62 m. mols per kg. of diet	P.O.	Tumors[595]	2 negative deaths at 8 mos.	At least 10 mos.
	26 rats	Holtzman	M	1.62 m. mols per kg. of diet	P.O.	Tumors[596]	----	At least 10 mos.
	16 rats	Holtzman	M	0.81 m. mols per kg. of diet for 3 mos.	P.O.	Tumors[597]	----	6 mos.
	10 rats	Holtzman	M	0.95 m. mols per kg. of diet for 4 mos.	P.O.	Tumors[598]	1 negative death at 8 mos.	8 mos.

[584] Adrenal transplants into spleen.
[585] 1 squamous papilloma of skin in external auditory canal, 2 ovarian adenocarcinomas, 1 multilocular cystademona and 5 nodular and cystic hyperplasia of the liver.
[585a] Normal controls.
[586] 1 cystadenoma, 3 with nodular and cystic hyperplasia of the liver.
[587] Spayed, and adrenal transplants into spleen
[588] 7 with nodular and cystic hyperplasia of the liver.
[589] 6 with nodular and cystic hyperplasia of the liver.
[590] 7 with hepatomas, 4 with nodular and cystic hyperplasia of the liver.
[591] 1 hyperplasia of liver, 2 hepatomas, 1 squamous papilloma in the external auditory canal.
[592] Mammary tumors in 17% of rats, 1 carcinosarcoma, fibroadenomas, intraductal papillomas and adenocarcinomas.
[593] No bladder tumors induced in contrast to other strains. An abstract with no further details.
[594] Of the bladder. An abstract with few details.
[595] Mammary gland tumors: 9 at 5 months, 21 at 8 months, 22 at 10 months; ear duct tumors: 2 at 6 months, 19 at 10 months; small intestine tumors: 1 at 6 months, 6 at 10 months.
[596] Liver tumors: 19 at 6 months, 24 at 10 months; ear duct tumors: 10 at 6 months, 11 at 10 months; small intestine tumors: 7 at 6 months, 13 at 10 months.
[597] 2 liver tumors at 6 months, 1 ear duct tumor at 6 months.
[598] Liver tumors: 1 at 6 months, 5 at 8 months, 1 ear duct tumor at 8 months; 2 small intestine tumors at 8 months.

Reference	Animal	Strain or type	Sex	Preparation and dose	Site and route	Animals with tumors	Survival	Duration of experiment
497.--2-ACETYLAMINOFLUORENE--Continued 								
Miller et al., 1955	13 rats	Holtzman	F	1.26 m.mols per kg. of diet for 3.5 mos.	P.O.	Tumors[599]	----	10 mos.
	26 rats	Holtzman	M	1.62 m.mols per kg. of diet for 8 mos.	P.O.	Tumors[600]	----	At least 8 mos.
	27 rats	Holtzman	F	1.62 m.mols per kg. of diet for 8 mos.	P.O.	Tumors[601]	2 neg. deaths at 8 mos.	At least 8 mos.
	12 rats	Holtzman	M	0.86 m.mols per kg. of diet for 14 wks.	P.O.	Tumors[602]	2 neg. deaths at 8 mos.	11 mos.
	14 rats	Holtzman	F	0.86 m.mols per kg. of diet for 13 wks.	P.O.	Tumors[603]	3 neg. deaths at 8 mos.	11 mos.
	9 rats	Holtzman	F	1.62 m.mols per kg. of diet for 8 mos.	P.O.	Tumors[604]	----	10 mos.
Schinz et al., 1955	10 rats	----	M	8 mg. per day, 0.1% in food for 115 d. (total dose 900 mg.)	P.O.	7[605]	Alive at 300 d.	373 d.
498.--4-ACETYLAMINOFLUORENE 								
Weisburger et al., 1952	Rats	----	----	0.25% in the diet	P.O.	0	----	13 mos.
Schinz et al., 1955	10 rats	----	M	8 mg. per day, 0.1% in food for 116 days (total dose 900 mg.)	P.O.	1[606]	Alive at 725 d.	900 d.
499.--9-ACETYLAMINOFLUORENE 								
Schinz et al., 1955	5 rats	----	M	47 mg. per day, 0.3% in food for 19 d. (900 mg. total dose)	P.O.	0	Alive at 610 d.	710 d.
	5 rats	----	M	30 mg. per day, 0.2% in food for 29 d. (total dose 900 mg.)	P.O.	0	Alive at 680 d.	984 d.
	10 rats	----	M	13 mg. per day, 0.1% in food for 69 d. (total dose 900 mg.)	P.O.	0	Alive at 535 d.	774 d.

[599] Mammary gland tumors: 1 at 6 months, 9 at 10 months; ear duct tumors: 2 at 8 months, 4 at 10 months; small intestine tumors: 1 at 8 months, 1 at 10 months.

[600] Liver tumors: 9 at 6 months, 24 at 10 months; ear duct tumors: 10 at 6 months, 11 at 10 months; small intestine tumors: 7 at 6 months, 13 at 10 months.

[601] Mammary gland tumors: 9 at 5 months, 21 at 8 months, 22 at 10 months; small intestine tumors: 1 at 6 months, 6 at 10 months. Epidermoid cyst with basal and squamous cell elements on the roof of the mouth, found at 8 months.

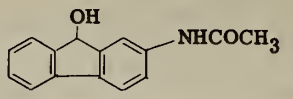
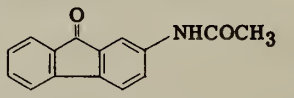
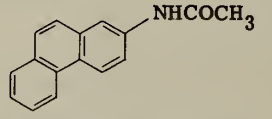
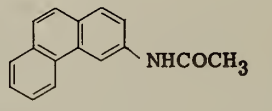
[602] Liver tumors: 2 at 7 months, 6 at 11 months, 1 ear duct tumor at 11 months, 1 small intestine tumor at 11 months, 1 fibroma (subcutaneous) found at 11 months.

[603] Mammary gland tumors: 1 at 3 months, 3 at 6 months, 4 at 11 months, 1 tumor of the small intestine.

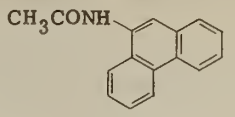
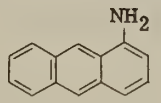
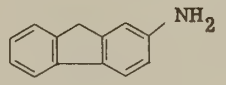
[604] Mammary gland tumors: 5 at 6 months, 7 at 10 months; ear duct tumors: 8 at 8 months, 8 at 10 months; small intestine tumors: 2 at 8 months, 2 at 10 months.

[605] Liver carcinomas, 3 with metastases to the regional lymph nodes and pancreatic area.

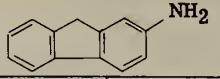
[606] Undifferentiated carcinoma of the colon.

Reference	Animal	Strain or type	Sex	Preparation and dose	Site and route	Animals with tumors	Survival	Duration of experiment
500. --2-ACETYLAMINO-9-FLUORENOL 								
Miller et al., 1955	9 rats	Holtzman	M	1.62 m.mols per kg. of diet for 8 mos.	P.O.	Tumors[607]	1 neg. death at 8 mos.	10 mos.
	9 rats	Holtzman	F	1.62 m.mols per kg. of diet for 8 mos.	P.O.	Tumors[608]	----	At least 8 mos.
501. --2-ACETYLAMINO-9-FLUORENONE 								
Miller et al., 1955	9 rats	Holtzman	M	1.62 m.mols per kg. of diet for 8 mos.	P.O.	Tumors[609]	----	At least 8 mos.
	9 rats	Holtzman	F	1.62 m.mols per kg. of diet for 8 mos.	P.O.	Tumors[610]	----	At least 8 mos.
502. --2-ACETYLAMINOPHENANTHRENE 								
Miller et al., 1955	16 rats	Holtzman	M	0.86 m.mols per kg. of diet for 14 wks.	P.O.	Tumors[611]	2 neg. deaths at 8 mos.	11 mos.
	18 rats	Holtzman	F	0.86 m.mols per kg. of diet for 13 wks.	P.O.	Tumors[612]	3 neg. deaths at 8 mos.	11 mos.
503. --3-ACETYLAMINOPHENATHRENE 								
Miller et al., 1955	9 rats	Holtzman	M	1.62 m.mols per kg. of diet for 8 mos.	P.O.	Tumors[613]	1 neg. death at 8 mos.	At least 8 mos.
	9 rats	Holtzman	F	1.62 m.mols per kg. of diet for 8 mos.	P.O.	Tumors[614]	1 neg. death at 8 mos.	At least 8 mos.

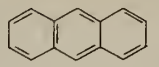
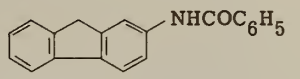
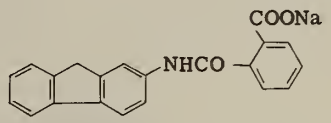
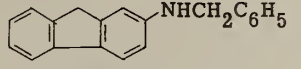
[607] 2 benign hepatomas at 10 months.
[608] 1 mammary gland tumor at 10 months.
[609] 4 liver tumors at 10 months, 1 small intestine tumor at 10 months.
[610] Mammary gland tumors: 3 at 8 months, 6 at 10 months, 1 ear duct tumor at 10 months.
[611] 4 ear duct tumors at 11 months, 3 small intestine tumors at 11 months, 1 adenocarcinoma of colon found at 9 months, 3 leukemias at 8 months, 3 leukemias at 11 months.
[612] Mammary gland tumors: 1 at 3 months, 8 at 6 months, 10 at 11 months, 2 ear duct tumors at 11 months, 7 small intestine tumors at 11 months, 2 leukemias at 5 months, 7 leukemias at 8 months, 7 leukemias at 11 months.
[613] 1 fibroma of mammary gland at 10 months: 3 ear duct tumors at 10 months, 2 small intestine tumors at 10 months, 1 adenoma of the lung found at 10 months.
[614] Mammary gland tumors: 3 at 5 months, 7 at 8 months, 8 at 10 months, 1 angioma of the uterine wall found at 9 months.

Reference	Animal	Strain or type	Sex	Preparation and dose	Site and route	Animals with tumors	Survival	Duration of experiment
504. --9-ACETYLAMINOPHENANTHRENE 								
Druckrey and Dannebert (unpub. data)	11 rats	White	----	5 mg. daily (total dose 90 mg.)	S.C.	0	5 alive after 1 yr.	32 mos.
505. --1-AMINOANTHRACENE 								
Bielschowsky, 1949b	Rats	----	----	----	Skin	0	----	----
506. --2-AMINOFLUORENE 								
Harris, 1947	29 rats	Wistar	M&F	4% in benzene, 2 - 5 times weekly	Skin	Tumors[615]	----	At least 408 d.
Kirby, 1948d	20 mice	C3H	M&F	In acetone (0.5% croton oil added)	Skin	Tumors[616]	13 died by 126 d.	506 d.
	16 mice	C57 black	M&F	4% in acetone twice weekly (0.5% croton oil added)	Skin	1[617]	----	597 d.
	26 mice	Cba	M&F	4% in acetone twice weekly (0.5% croton oil added)	Skin	1 epi.[618]	17 died by 125 d.	594 d.
	24 mice	C57 black	M&F	0.5 ml. of 2.0% in either arachis oil or tricaprylin every 4 wks.	S.C.	1 sarc.[619]	12 died by 500 d.	616 d.
	29 mice	Cba	M&F	0.5 ml. of 2.0% in either arachis oil or tricaprylin every 4 wks.	S.C.	Tumors[620]	----	At least 630 d.
	35 mice	C3H	M&F	0.5 ml. of 2.0% in either arachis oil or tricaprylin every 4 wks.	S.C.	Tumors[621]	34 died by 259 d.	391 d.
Lacassagne et al., 1948b	5 rats	----	F	0.1% in the diet for 1 yr.	P.O.	1[622]	----	667 d.
	5 rats	----	M	0.1% in the diet for 1 yr.	P.O.	Tumors[623]	----	667 d.
	6 rats	----	F	50 mg. in 1 ml. peanut oil monthly for 6 mos.	S.C.	Tumors[624]	----	687 d.
	4 rats	----	M	50 mg. in 1 ml. peanut oil monthly for 5 mos.	S.C.	2[625]	----	687 d.

[615] Of the liver; also acoustic duct tumors.
[616] 2 hepatomas, 3 mammary carcinomas, 1 kidney carcinoma.
[617] Hepatoma.
[618] Also 8 hepatoma, 1 mammary carcinoma, 1 ovary carcinoma, 1 bladder carcinoma.
[619] Also 5 hepatomas.
[620] 5 hepatomas, 1 ovarian carcinoma.
[621] 1 hepatoma, 1 mammary carcinoma.
[622] Uterine fibroma.
[623] 1 fibrosarcoma of the kidney, 1 carcinoma of the intra-hepatic biliary ducts.
[624] 2 fibrous tumors of the bone (1 sarcomatous), 1 fibrosarcoma.
[625] Fibrosarcomas.

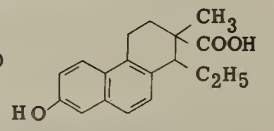
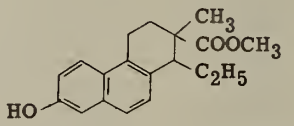
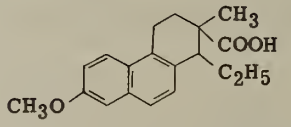
Reference	Animal	Strain or type	Sex	Preparation and dose	Site and route	Animals with tumors	Survival	Duration of experiment
506.--2-AMINOFLUORENE--Continued 								
Morris et al., 1948a	10 rats	----	----	In acetone 3 times per wk. (total 0.5 - 1 mg. per wk.)	Skin	Tumors[626]	----	Over 6 mos.
	10 rats	----	----	0.05% in the diet	P.O.	Tumors[627]	----	----
Horning, 1950	31 mice	A	M&F	Crystals plus a graft of lung tissue	S.C.	Tumors[628]	----	Over 12 wks.
Morris et al., 1950a	11 rats	Minnesota	M&F	0.05% in the diet for 23 wks. (537 mg. per rat)	P.O.	5[629]	----	At least 284 d.
	11 rats	Minnesota and Wistar	M&F	2% in acetone 3 times weekly (53 mg. per rat)	Skin	7[630]	----	At least 508 d.
Cambel and Ray, 1952	Rats	Sprague-Dawley-Holtzman	----	----	Skin	Pap.[631]	----	----
	Rats	Sprague-Dawley-Holtzman	----	Emulsion	I.P.	Pap.[631]	----	----
Ray et al., 1952	12 rats	Sprague-Dawley-Holtzman	----	0.01 mg. of a dilute aqueous emulsion daily, 36 times	I.P.	4 pap.[631]	12 alive at 6 mos.	At least 12 mos.
	12 rats	Sprague-Dawley-Holtzman	----	0.2 mg. daily in benzene	Skin	0	12 alive at 6 mos.	At least 12 mos.
	12 rats	Sprague-Dawley-Holtzman	----	0.2 mg. daily in eugenol and benzene	Skin	0	12 alive at 6 mos.	At least 12 mos.
	12 rats	Sprague-Dawley-Holtzman	----	0.2 mg. daily in benzene, 36 times	Skin	0	11 alive at 6 mos.	At least 12 mos.
	12 rats	Sprague-Dawley-Holtzman	----	0.2 mg. daily in amyl acetate, 36 times	Skin	1 pap.[631]	7 alive at 6 mos.	At least 12 mos.
	12 rats	Sprague-Dawley-Holtzman	----	0.8% soln. in benzene, 2 brush strokes daily,	Skin	2 pap.[631]	12 alive at 6 mos.	At least 12 mos.
Miller et al., 1955	9 rats	Holtzman	F	1.62 m.mols per kg. of diet	P.O.	Tumors[632]	----	At least 10 mos.
	9 rats	Holtzman	M	1.62 m.mols per kg. of diet	P.O.	Tumors[633]	----	At least 10 mos.

[626] In 6 rats, type not specified except 4 were of the skin.
[627] 6; 4 of the skin.
[628] 11 adenomas and 2 early bronchogenic carcinomas in grafts.
[629] 3 cholangioma, 4 mammary carcinomas, 1 squamous cell carcinoma of the ear duct.
[630] 1 cholangioma, 4 mammary carcinomas, 3 epithelioma of skin. 1 pituitary adenoma.
[631] Of the forestomach.
[632] Mammary gland tumors: 1 at 5 months, 4 at 8 months, 7 at 10 months; 5 ear duct tumors at 10 months.
[633] 9 liver tumors at 10 months, 5 ear duct tumors at 10 months, 4 small intestine tumors.

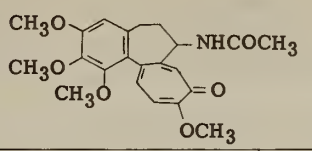
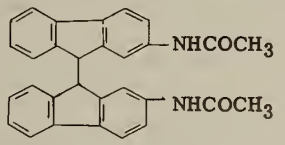
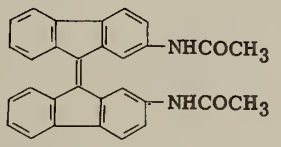
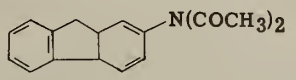
Reference	Animal	Strain or type	Sex	Preparation and dose	Site and route	Animals with tumors	Survival	Duration of experiment
507. --ANTHRACENE 								
Russell, 1947	5 rabbits	----	----	10-20 mg. pellets	cerebrum	0	2 alive at 4.5 yrs.	4.5 yrs.
	2 rabbits	----	----	12 mg. pellets	cerebellum	0	1 alive at 4.5 yrs.	4.5 yrs.
	2 rabbits	----	----	4 and 5 mg. pellets	eye	0	All alive at 4.5 yrs.	4.5 yrs.
Bergol'ts and Il'yina, 1951	25 mice	CC57	----	2.5 mg. in 0.5 cc. peach oil	S.C.	0[632a]	All alive up to 260 d.	At least 260 d.
Schmahl and Reiter (unpub. data)	31 rats	White	----	6 mg. daily (total dose 4.4 g.)	P.O.	0	22 alive after 1 yr.	33 mos.
508. --2-BENZOYLAMINOFLUORENE 								
Cambel and Ray, 1952	Rats	Sprague-Dawley-Holtzman	----	Skin painting	Skin	Pap.[631]	----	----
Ray et al., 1952	12 rats	Sprague-Dawley-Holtzman	----	0.2 mg. daily in eugenol and amyl acetate	Skin	2 pap.[631]	12 alive at 6 mos.	At least 12 mos.
	12 rats	Sprague-Dawley-Holtzman	----	0.2 mg. daily in amyl acetate	Skin	0	12 alive at 6 mos.	At least 12 mos.
509. --2-BENZOYLAMINOFLUORENE-2'-CARBOXYLIC ACID, SODIUM SALT 								
Ray et al., 1952	12 rats	Sprague-Dawley-Holtzman	----	0.2 mg. daily in amyl acetate, 36 times	Skin	3 pap.[631]	12 alive at 6 mos.	At least 12 mos.
510. --2-BENZYLAMINOFLUORENE 								
Cambel and Ray, 1952	Rats	Sprague-Dawley-Holtzman	----	Skin painting	Skin	Pap.[631]	----	----

[631] Of the forestomach.

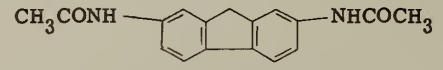
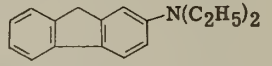
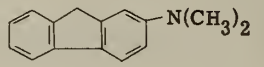
[632a] No tumors recorded; no fluorescence at site as early as 25 to 50 days.

Reference	Animal	Strain or type	Sex	Preparation and dose	Site and route	Animals with tumors	Survival	Duration of experiment
510.--2-BENZYLAMINOFLUORENE--Continued								
Ray et al., 1952	7 rats	Sprague-Dawley-Holtzman	----	0.2 mg. daily in amyl acetate, 36 times	Skin	0	7 alive at 6 mos.	At least 12 mos.
	16 rats	Sprague-Dawley-Holtzman	----	0.2 mg. daily in eugenol and amyl acetate	Skin	0	16 alive at 6 mos.	At least 12 mos.
	12 rats	Sprague-Dawley-Holtzman	----	0.2 mg. daily in amyl acetate, 36 times	Skin	2 pap.[631]	12 alive at 6 mos.	At least 12 mos.
511.--BISDEHYDRODOISYNOLIC ACID 								
Mardones and Iglesias, 1951	30 guinea pigs	----	F, castr.	0.5 to 80 μg. 3 times weekly	S.C.	0	All survived	3 mos.
512.--BISDEHYDRODOISYNOLIC ACID METHYL ESTER 								
Mardones and Iglesias, 1951	6 guinea pigs	----	F, castr.	Tablets; daily absorption 26 - 105 μg.	S.C.	Tumors[633a]	----	90 d.
	18 guinea pigs	----	----	Tablets; daily absorption 52 - 129 μg.	Spleen	Tumors[634a]	----	90 d.
513.--BISDEHYDRODOISYNOLIC ACID 7-METHYL ETHER 								
Mardones and Iglesias, 1951	7 guinea pigs	----	F, castr.	Tablets; daily absorption 135 - 369 μg.	S.C.	Tumors[635a]	----	93 d.
	8 guinea pigs	----	----	Tablets; daily absorption 120 - 375 μg.	Spleen	Tumors[634a]	----	93 d.
Kirkman, 1952	Hamsters	Golden	M	Pellets, 47 gm. absorbed in 282 d.	S.C.	20[636a]	----	331 d. average
Kirkman and Bacon, 1952b	7 hamsters	Golden	M	Pellets	S.C.	1[637a]	----	388 d. average

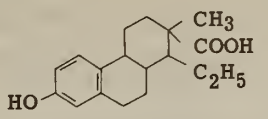
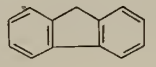
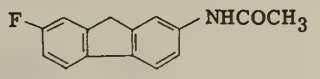
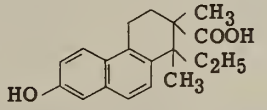
[631] Of the forestomach.
[633a] Multiple uterine adenomas and 1 submucosal fibroma.
[634a] Large intra-uterine polyps and many cases of abdominal fibromas.
[635a] Multiple uterine adenomas and tumor reactions with large doses.
[636a] Hepatomas.
[637a] Renal tumor; histology different from estrogen induced tumors.

Reference	Animal	Strain or type	Sex	Preparation and dose	Site and route	Animals with tumors	Survival	Duration of experiment
514. --COLCHICINE 								
Setälä, 1948	Mice	----	----	In dioxane	Skin	0 tumors[634]	----	At least 2 mos.
Setälä, 1949	Mice	----	M&F	0.01 to 0.1% in dioxane, 3 times weekly	Skin	0	----	12 wks.
Lambers, 1951	56 mice	----	----	0.02% aqueous soln., 12 μg. for 50 d. daily	I.P.	0	15 alive at 50 d.	63 d.
	33 mice	----	----	0.02% aqueous soln., 15 μg. daily	I.P.	0	11 alive at 20 d.	85 d.
Rogers, 1951	60 mice	Swiss	M	0.004 mg. per gm. body wt., 2 inj., 1 wk. interval	S.C.	0[635]	16 died following Inj.	6 mos.
Ferguson, Jr., 1952	69 rats	Wistar	M&F	0.1 - 1.6 mg. per kg. per day	I.P.	0	33% died after 3 inj.	5 wks.
Kellner and Matko, 1953	44 rats	----	----	0.2% soln. in saline, 125 to 170 μg. per 100 g. body wt. every 3rd day for 8 to 10 wks.	S.C.	0	Most died by 10 wks.	At least 10 wks.
515. --2,2'-DIACETYLAMINO-9,9'-BIFLUORYL 								
Morris and Dubnik, 1950	Rats	Sprague-Dawley	F	0.025% in the diet for 30 wks.	P.O.	0	----	30 wks.
516. --2,2'-DIACETYLAMINO-9,9'-BIFLUORYLIDINE 								
Morris and Dubnik, 1950	Rats	Sprague-Dawley	F	0.025% in the diet for 30 wks.	P.O.	Tumors[635b]	----	30 wks.
517. --N,N-DIACETYL-2-AMINOFLUORENE 								
Morris et al., 1948a	Rats	----	----	In acetone 3 times per wk. (total 0.5 - 1 mg. per wk.)	Skin	----	----	----

[634] Possible epithelial hyperplasia.
[635] Lung adenoma incidence was the same as in the untreated controls.
[635b] Very few. No other details.

Reference	Animal	Strain or type	Sex	Preparation and dose	Site and route	Animals with tumors	Survival	Duration of experiment
517.--N,N-DIACETYL-2-AMINOFLUORENE--Continued								
Morris et al., 1950a	11 rats	Minnesota and Wistar	M&F	2% in acetone 3 times weekly (65 mg. per rat)	Skin	9[636]	----	646 d.
	12 rats	Minnesota	M&F	0.05% in the diet for 23 wks. (216 mg. per rat)	P.O.	12[637]	----	At least 23 wks.
Morris et al., 1951	Rats	A x C	M&F	0.05% in the diet for 1 mo.	P.O.	Tumors[638]	----	Over 6 wks.
518.--2,7-DIACETYLAMINOFLUORENE 								
Morris and Dubnik, 1950	Rats	Sprague-Dawley	F	0.025% in the diet for 30 wks.	P.O.	Tumors[639]	----	30 wks.
519.--N-DIETHYL-2-AMINOFLUORENE 								
Bielschowsky, 1952	10 rats	Piebald Sheffield	M&F	4.0 mg. in the diet daily for 25 wks.	P.O.	Tumors[640]	----	63 wks.
520.--N-DIMETHYL-2-AMINOFLUORENE 								
Bielschowsky, 1949b	10 rats	----	----	3.5 mg. in the diet daily for 30 wks.	P.O.	Tumors[645]	----	Over 36 wks.
Bielschowsky, 1952	10 rats	Wistar	M&F	3.8 mg. in peanut oil, 3 doses per wk., total of 90 doses	P.O.[23]	Tumors[641]	----	52 wks.
Miller et al., 1955	9 rats	Holtzman	M	1.62 m.mols per kg. of diet	P.O.	Tumors[642]	----	At least 10 mos.
	9 rats	Holtzman	F	1.62 m.mols per kg. of diet	P.O.	Tumors[643]	1 neg. death at 8 mos.	At least 10 mos.
Schinz et al., 1955	10 rats	----	F	10 mg. per day, 0.1% in food for 88 d. (total dose 900 mg.)	P.O.	3[644]	----	740 d.

[23] Stomach tube.
[636] 2 hepatomas, 2 cholangiomas, 8 mammary carcinomas, 1 ear duct carcinoma, 2 leukemias.
[637] 12 hepatomas.
[638] Hepatomas. No details.
[639] Greater incidence than with 2-acetylaminofluorene. No other details.
[640] 1 hepatoma, 2 intestinal carcinomas, 2 lung tumors.
[641] 3 ear duct carcinomas and 3 mammary carcinomas.
[642] 1 ear duct tumor at 10 months, 1 lymphoblastic lymphosarcoma in colon found at 10 months.
[643] Mammary gland tumors: 1 at 5 months, 2 at 8 months, 4 at 10 months, 2 tumors of the small intestine at 10 months.
[644] Breast carcinoma, and retroperitoneal tumor.
[645] 3 malignancies (not specified), 2 benign adenomas of lung, 1 papilloma of breast.

Reference	Animal	Strain or type	Sex	Preparation and dose	Site and route	Animals with tumors	Survival	Duration of experiment
521.--DOISYNOLIC ACID 								
de Pasqualini and Bur, 1949	4 guinea pigs	----	F, castr.	0.5 mg. per animal per d., 6 d. per wk., in tablet form (total of 36 mg.)	P.O.	Tumors[645a]	Sacrificed between 85 and 98 d.	98 d.
	4 guinea pigs	----	M, castr.	0.5 mg. per animal per d., 6 d. per wk., in tablet form (total of 70 mg.)	P.O.	Tumors[646a]	Sacrificed between 160 and 162 d.	162 d.
522.--FLUORENE 								
Riegel et al., 1951	20 mice	CF 1	M&F	0.30% in acetone twice weekly for 31 wks.	Skin	0	16 alive at 31 wks.	31 wks.
523.--7-FLUORO-2-ACETYLAMINOFLUORENE 								
Miller et al., 1955	16 rats	Holtzman	M	0.81 m.mols per kg. of diet for 3 mos.	P.O.	Tumors[646]	----	6 mos.
	10 rats	Holtzman	M	0.95 m.mols per kg. of diet for 4 mos.	P.O.	Tumors[647]	3 neg. deaths at 8 mos.	8 mos.
	12 rats	Holtzman	F	1.26 m.mols per kg. of diet for 3.5 mos.	P.O.	Tumors[648]	3 neg. deaths at 8 mos.	10 mos.
	10 rats	Holtzman	F	1.62 m.mols per kg. of diet for 4.5 mos.	P.O.	Tumors[649]	1 neg. death at 8 mos.	10 mos.
524.--1-METHYL BISDEHYDRODOISYNOLIC ACID[649a] 								
Rodriguez, 1950b	Rats[650a]	----	F	15 or 50 μg. per d. mixed with 25 mg. of lactose and suspended in 0.5 ml. of sodium chloride soln., 0.9% for 6 mos.; treatment began one wk. after surgery.	S.C.	0[651a]	----	1 yr.

[645a] Fibromas at operative site and in abdominal cavity.

[646] 12 liver tumors at 6 months, 2 ear duct tumors at 6 months, 4 small intestine tumors at 6 months.

[646a] 100% fibromas in abdominal cavity, thoracic cavity and at operative site.

[647] 6 liver tumors at 8 months, 2 ear duct tumors at 8 months, 1 adenocarcinoma of the bladder found at 4 months.

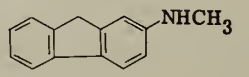
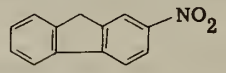
[648] Liver tumors: 1 at 6 months, 4 at 8 months, 8 at 10 months; 2 mammary gland tumors at 10 months; ear duct tumors: 1 at 8 months, 1 at 10 months; small intestine tumors: 3 at 6 months, 6 at 10 months; 1 adenocarcinoma of uterus found at 10 months.

[649] Liver tumors: 4 at 8 months, 8 at 10 months; mammary gland tumors: 2 at 6 months, 3 at 10 months; 1 ear duct tumor at 10 months; 5 small intestine tumors at 10 months; 1 transitional carcinoma of bladder found at 9 months.

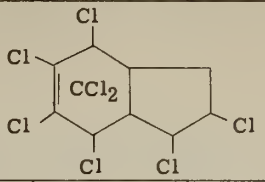
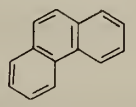
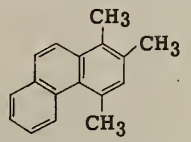
[649a] Phenocycline.

[650a] Ovaries and 95% of the pancreas removed.

[651a] Hyperplasia of islet of Langerhans and adenomatous hyperplasia of the pituitary.

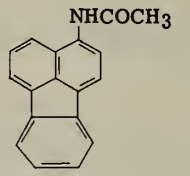
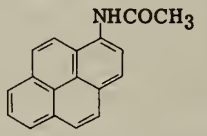
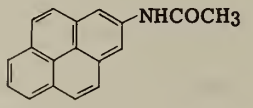
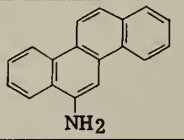
Reference	Animal	Strain or type	Sex	Preparation and dose	Site and route	Animals with tumors	Survival	Duration of experiment
524.--1-METHYL BISDEHYDRODOISYNOLIC ACID--Continued								
Tuchmann-Duplessis and Mercier-Parot, 1952	Rats	----	M	20 μg. in oil daily	S.C.	0	----	62 d.
Tuchmann-Duplessis and Levasseur, 1953	Rats[652a]	Wistar	M&F	Increasing doses, 2 to 100 μg. for varying periods (8 to 60 d.)	S.C.	0[653a]	----	60 d.
525.--N-MONOMETHYL-2-AMINOFLUORENE 								
Bielschowsky, 1949b	10 rats	----	----	3.5 mg. in the diet daily for 30 wks.	P.O.	Tumors[650]	----	441 d.
Bielschowsky, 1952	10 rats	Piebald, Sheffield strain	M&F	3.5 mg. in the diet daily for 25 wks.	P.O.	Tumors[651]	----	63 wks.
	10 rats	Wistar	M&F	3.5 mg. in peanut oil, 3 doses per wk., total of 90 doses	P.O.[23]	Tumors[652]	----	52 wks.
526.--2-NITROFLUORENE 								
Morris et al., 1948a	9 rats	----	----	0.05% in the diet	P.O.	Tumors[653]	----	----
	10 rats	Buffalo	----	In acetone 3 times weekly (total 0.5 - 1 mg. per wk.)	Skin	Tumors[653]	----	Over 6 mos.
Morris et al., 1950a	9 rats	Minnesota	M&F	0.05% in the diet for 23 wks. (756 mg. per rat)	P.O.	2[654]	----	310 d.
	10 rats	Minnesota & Wistar	M&F	2% in acetone 3 times weekly (69 mg. per rat)	Skin	6[655]	----	560 d.
Miller et al., 1955	9 rats	Holtzman	F	1.62 m.mols per kg. of diet	P.O.	Tumors[656]	----	At least 10 mos.
	9 rats	Holtzman	M	1.62 m.mols per kg. of diet	P.O.	Tumors[657]	----	At least 10 mos.

[650] 8 developed neoplasms, 8 malignant.
[651] 4 hepatomas, 1 ear duct carcinoma, 1 intestinal carcinoma, 4 lung tumors.
[652] 2 hepatomas, 6 ear duct carcinomas, 3 lung tumors and 4 mammary carcinomas.
[652a] Some castrates, some hypophysectomized, some normal.
[653] Type not specified (not hepatoma).
[653a] Hyperplasia of the adrenals.
[654] 1 mammary carcinoma, 1 ear duct carcinoma.
[655] 1 mammary, 2 pituitary adenomas, 2 lung lymphosarcomas, 1 subcutaneous fibroma, 1 anaplastic carcinoma of salivary gland.
[656] 4 mammary gland tumors at 10 months.
[657] 1 liver tumor at 10 months, 1 small intestine tumor at 10 months. One male rat had adenocarcinoma of the lung. Five of seven male and two of 2 female rats examined had papillomas of carcinomas of the forestomach.

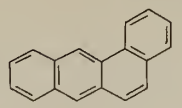
Reference	Animal	Strain or type	Sex	Preparation and dose	Site and route	Animals with tumors	Survival	Duration of experiment
527.--1,2,4,5,6,7,8,8-OCTACHLORO-4,7-METHANO-3a,4,7,7a-TETRAHYDROINDAN [658] 								
Stohlman et al., 1950	9 rabbits	----	----	400 mg. per kg. per day as 10% in olive oil	P.O.[23]	0	7 died	31 d.
	12 rats	----	M	0.05% in the diet	P.O.	0	All dead in 70 d.	70 d.
	12 rats	----	M	0.03% in the diet	P.O.	0	75% died in 70 d.	100 d.
	9 rabbits	----	----	400 mg. per kg. per day as 10% in olive oil	P.O.[23]	0	7 died	31 d.
Ingle, 1952	20 rats	Osborne-Mendel	M&F	150 p.p.m. in the diet	P.O.	0	16 alive at 80 wks.	84 wks.
	40 rats	Osborne-Mendel	M&F	300 p.p.m. in the diet	P.O.	0	10 alive at 60 wks.	104 wks.
	40 rats	Osborne-Mendel	M&F	150 p.p.m. in the diet	P.O.	0	7 alive at 104 wks.	104 wks.
	40 rats	Osborne-Mendel	M&F	30 p.p.m. in the diet	P.O.	0	15 alive at 104 wks.	104 wks.
	40 rats	Osborne-Mendel	M&F	10 p.p.m. in the diet	P.O.	0	16 alive at 104 wks.	104 wks.
	40 rats	Osborne-Mendel	M&F	5 p.p.m. in the diet	P.O.	0	20 alive at 104 wks.	104 wks.
Ambrose et al., 1953b	60 rats	Albino	M&F	0.001 - 0.032% in the diet	P.O.	0	52 alive	407 d.
528.--PHENANTHRENE 								
Prina and Tentoni, 1949	3 rats	----	----	Crystals	Right femur	0	----	5 mos.
529.--1,2,4-TRIMETHYLPHENANTHRENE 								
Butenandt and Dannenberg, 1953	10 mice	----	M&F	0.4% in benzene, 2 drops twice weekly	Skin	1 epi., 1 pap.	----	238 d.

[23] Stomach tube.

[658] Chlordan.

Reference	Animal	Strain or type	Sex	Preparation and dose	Site and route	Animals with tumors	Survival	Duration of experiment
530.--3-ACETYLAMINOFLUORANTHENE 								
Schinz et al., 1955	10 rats	----	M	8 mg. per day, 0.1% in food for 112 d. (total dose 900 mg.)	P.O.	2[659]	----	700 d.
531.--1-ACETYLAMINOPYRENE 								
Miller et al., 1955	8 rats	Holtzman	M	1.62 m.mols per kg. of diet for 8 mos.	P.O.	0	----	At least 8 mos.
	9 rats	Holtzman	F	1.62 m.mols per kg. of diet for 8 mos.	P.O.	Tumors[660]	2 neg. deaths at 8 mos.	At least 8 mos.
532.--2-ACETYLAMINOPYRENE 								
Miller et al., 1955	6 rats	Holtzman	M	1.62 m.mols per kg. of diet for 8 mos.	P.O.	0	----	At least 8 mos.
	6 rats	Holtzman	F	1.62 m.mols per kg. of diet for 8 mos.	P.O.	Tumors[661]	----	----
533.--6-AMINOCHRYSENE[662] 								
Rudali et al., 1953	8 mice	XVIII	M	2 mg. in 0.1 ml. peanut oil	S.C.	0	3 alive at 336 d.	1 yr.
	10 mice	NLC	M	1 drop of 0.3% in acetone twice weekly for 30 wks.	Skin	0	6 alive at 231 d.	1 yr.
	12 rats	----	M	0.05% in the diet (average of 19 g. per rat per day)	P.O.	0	----	240 d.

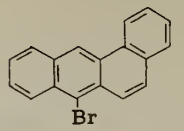
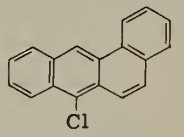
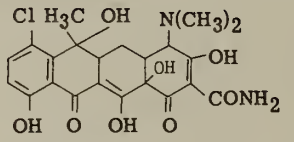
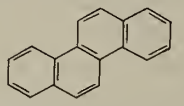
[659] Lymphosarcoma and papillary carcinoma of the skin.
[660] 1 ear duct tumor at 10 months.
[661] 1 liver tumor at 10 months, 2 mammary tumors at 10 months.
[662] Called "2-aminochrysene" in original paper.

Reference	Animal	Strain or type	Sex	Preparation and dose	Site and route	Animals with tumors	Survival	Duration of experiment
534.--1,2-BENZANTHRACENE 								
Howes and De Oliveira, 1948	Rats	Wistar	----	Impregnated silk threads	In gastric mucosa	0	----	590 d.
Bauer and Byrne, 1950	9 rabbits	----	----	1.2 mg. of a 20% soln. in beeswax pellets (2 - 3 pellets of 1.2 mg. each)	Parotid duct	0	Sacrificed at intervals	1.5 yrs.
	9 rabbits	----	----	Pellets, 20% in beeswax	Parotid gland	0	Sacrificed at intervals	1.5 yrs.
Byrne and Bauer, 1950	Rabbits	----	----	Pellets	Parotid gland	0	Sacrificed at intervals	12 mos.
Bergol'ts and Il'yina, 1951	60 mice	CC57	----	2.5 mg. in 0.5 cc. peach oil	S.C.	0[662a]	----	At least 260 d.'
Hill et al., 1951	20 mice	CAF_1	M&F	0.4% in mineral oil twice weekly for 68 wks.	Skin	1 pap.	15 alive at 56 wks.	68 wks.
Howes and De Oliveira, 1951	75 rats	Wistar	----	Impregnated silk thread	Under serosa of stomach	0	----	----
Steiner and Falk, 1951	50 mice	C57 black	M&F	5.0 mg. in 0.5 cc. tricaprylin	S.C.	8 sarc.	46 alive at 4 mos.	22 mos.
Klein, 1952b	35 mice	Albino	M	4.0 mg. per ml. in olive oil (0.04 ml. per mouse)	I.M.	0	----	456 d.
	35 mice	Albino	M	4.0 mg. per ml. 0.1% soln. of croton oil in olive oil (0.04 ml. per mouse)	I.M.	0	----	447 d.
	35 mice	Albino	M	4.0 mg. per m. 1% soln. of croton oil in olive oil (0.04 ml. per mouse)	I.M.	3[663]	----	466 d.
	35 mice	Albino	M	4.0 mg. per ml. 3.0% soln. of croton oil in olive oil (0.04 ml. per mouse)	I.M.	1[664]	----	458 d.
	35 mice	Albino	M	4.0 mg. per ml. 5% soln. of croton oil in olive oil (0.04 ml. per mouse)	I.M.	0	----	422 d.
Steiner and Edgecomb, 1952	50 mice	C57 Black	M&F	0.05 mg. in 0.5 cc. tricaprylin	S.C.	5 sarc.	43 alive at 9 mos.	28 mos.
	50 mice	C57 Black	M&F	0.2 mg. in 0.5 cc. tricaprylin	S.C.	11 sarc.	43 alive at 9 mos.	28 mos.
	50 mice	C57 Black	M&F	1.0 mg. in 0.5 cc. tricaprylin	S.C.	15 sarc.	31 alive at 9 mos.	28 mos.
	210 mice	C57 Black	M&F	5.0 mg. in 0.5 cc. tricaprylin	S.C.	49 sarc.	145 alive at 9 mos.	28 mos.
	30 mice	C57 Black	M&F	10.0 mg. in 0.5 cc. tricaprylin	S.C.	5 sarc.	16 alive at 9 mos.	28 mos.

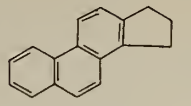
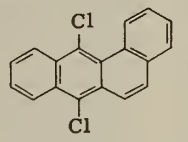
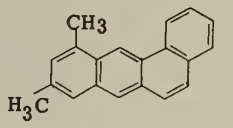
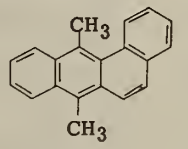
[662a] No tumors recorded; no fluorescence after 60 days at site.

[663] 2 hemangio-endotheliomas, 1 fibrosarcoma, mean latent period 377 days.

[664] Hemangio-endothelioma, mean latent period 375 d.

Reference	Animal	Strain or type	Sex	Preparation and dose	Site and route	Animals with tumors	Survival	Duration of experiment
535.--10-BROMO-1,2-BENZANTHRACENE 								
Lacassagne et al., 1948a	10 mice	XVII	----	1 drop of a 0.3% soln. in acetone twice a wk.	Skin	1[665]	Alive at 300 d.	679 d.
Lindner and Muller, 1954	10 rats	Wistar	F	Single injection of 4.1 mg. in 0.1 ml. tricaprylin	S.C.	1 sarc.[666]	4 alive at 24 mos.	24 mos.
536.--10-CHLORO-1,2-BENZANTHRACENE 								
Lindner and Muller, 1954	10 rats	Wistar	F	Single injection of 3.5 mg. in 0.1 ml. tricaprylin	S.C.	0	6 alive at 12 mos., 2 at 24 mos.	24 mos.
537.--CHLORTETRACYCLINE[667] 								
Watson and Witts, 1952	16 rats[668]	----	----	30 mg. per day average in the diet	P.O.	0	5 died before 5 days	Over 180 d.
Forbes et al., 1953	Rats	Carworth or Sprague-Dawley	M	25 and 5 mg. per day in the diet (diet inducing liver necrosis)	P.O.	0	----	200 d.
Johansson et al., 1953	16 rats	Sprague-Dawley	M	100 p.p.m.[669] in the diet	P.O.	0	----	30 d.
Roine et al., 1953	9 guinea pigs	----	----	50 mg. per kg. in diet[669]	P.O.	0	1 alive at 6 wks.	6 wks.
538.--CHRYSENE 								
Steiner and Falk, 1951	50 mice	C57 Black	M&F	5.0 mg. in 0.5 cc. tricaprylin	S.C.	4 sarc.	39 alive at 4 mos.	22 mos.
Riegel et al., 1951	20 mice	CF1	M&F	0.20% in acetone twice weekly for 31 wks.	Skin	1 epi.	16 alive at 30 wks.	31 wks.

[665] Pulmonary adenoma.
[666] Latent period 18 months.
[667] Aureomycin.
[668] With artificial intestinal diverticulum.
[669] Of the hydrochloride.

Reference	Animal	Strain or type	Sex	Preparation and dose	Site and route	Animals with tumors	Survival	Duration of experiment
539. --1,2-CYCLOPENTENOPHENANTHRENE 								
Butenandt and Dannenberg, 1953	10 mice	Bl.H.	M&F	5 mg. in 0.2 ml. sesame oil, 1 inj.	S.C.	0	9 alive at 6 mos.	327 d.
	22 mice	Bl.H.	M&F	0.4% in benzene, 2 drops twice weekly	Skin	1[669a]	4 alive at 12 mos.	547 d.
540. --9,10-DICHLORO-1,2-BENZANTHRACENE 								
Lacassagne et al., 1948a	10 mice	XVII	----	1 drop of a 0.3% soln. in acetone twice weekly	Skin	Tumors[671]	Alive at 250 d.	411 d.
541. --6,8-DIMETHYL-1,2-BENZANTHRACENE 								
Hill et al., 1951	30 mice	CAF_1	M&F	0.4% in mineral oil twice weekly for 37 wks.	Skin	1 pap.	25 alive at 58 wks.	68 wks.
542. --9,10-DIMETHYL-1,2-BENZANTHRACENE 								
Engelbreth-Holm and Iversen, 1947	23 mice	Street	----	0.5% in benzene, 2 times weekly	Skin	2 sarc., 10 pap.	All died 3-4 mos.	4 mos.
	28 mice	Street	----	1 mg. in peanut oil	S.C.	10 sarc., 1 epi.	----	----
Mosinger, 1947	8 guinea pigs	----	----	0.5 - 1 mg. (in olive oil 0.1%) in 4 mos. 3 - 5 mg.	S.C.	4[672]	----	7 mos.
Krotkina, 1948	5 monkeys	Rhesus	----	15 mg.	Femur cavity by trephine	----	----	----
	5 monkeys	Rhesus	F	15 mg. paraffin pellet	Bone cavity[673]	0[674]	----	4 yrs. to date

[669a] Mammary carcinoma.
[671] Papillomas and carcinomas.
[672] Fibrosarcomas.
[673] Trephine of major bone, pellet inserted and hole closed.
[674] Periodic X-ray study, no lesion.

Reference	Animal	Strain or type	Sex	Preparation and dose	Site and route	Animals with tumors	Survival	Duration of experiment
542.--9,10-DIMETHYL-1,2-BENZANTHRACENE--Continued								
Nordén, 1948	Mice	----	----	2% in peanut oil, 0.05 ml., 2 times weekly	S.C.	1[675]	----	At least 9 wks.
Rask-Nielson, 1948	> 126 mice	Street	M&F	0.02 or 0.5 mg. in paraffin	Kidney	Tumors[676]	34 alive at 6 mos.	Over 18 mos.
	68 mice	Street	M&F	0.5 mg. in paraffin	Skin intradermal inj.	Tumors[677]	34 alive at 6 mos.	Over 18 mos.
	> 144 mice	Street	M&F	0.005 - 0.5 mg. in paraffin	Lymph node	Tumors[680]	174 alive at 3 mos.	18 - 21 mos.
	> 203 mice	Street	M&F	0.02 or 0.5 mg. in paraffin	Mammary gland	Tumors[681]	137 alive at 6 mos.	12 - 24 mos.
	> 158 mice	Street	M&F	0.02 or 0.5 mg. in paraffin	Spleen	Tumors[682]	57 alive at 6 mos.	12 - 24 mos.
	> 162 mice	Street	M&F	0.02 or 0.5 mg. in paraffin	Lung	Tumors[684]	49 alive at 6 mos.	12 - 24 mos.
	> 50 mice	Street	M&F	0.005 - 0.5 mg. in paraffin	Thymus	Tumors[685]	32 alive at 6 mos.	9 - 27 mos.
	79 mice	Street	F	0.02 mg. in paraffin, injected into lactating mammary gland	S.C.	Tumors[686]	74 alive at 3 mos.	Over 21 mos.
	Mice	Street	M&F	0.02 mg. in paraffin	Bone marrow	Tumors[691]	71 alive at 3 mos.	27 mos.
	Mice	Street	M&F	0.02 mg. in paraffin	S.C.	Tumors[694]	22 alive at 12 mos.	Over 30 mos.
	Mice	Street	M&F	0.02 mg. in paraffin, injected into skin	S.C.	0	9 alive at 12 mos.	Over 30 mos.
	187 mice	Street	M&F	0.4 mg. in paraffin	S.C.	Tumors[696]	37 alive at 6 mos.	12 mos.
	> 152 mice	Street	M	0.02 or 0.5 mg. in paraffin	Testis	Tumors[697]	At least 44 alive at 6 mos.	9 - 24 mos.
Setälä, 1948	Mice	----	----	In dioxane	Skin	Pap.[698]	----	At least 18 wks.
	Mice	----	----	In Carbowax 1500	----	Tumors[699]	----	At least 17 wks.

[675] Pavement epithelial cancer in the forestomach at 9 weeks. Other animals with atypical epithelial proliferation.
[676] 2 thymic tumors, 1 leukemia, 3 pulmonary adenomas, 1 granulosa cell tumor of ovary.
[677] 2 thymic tumors, 1 leukemia.
[680] 2 leukemias, 13 thymic tumors, 8 pulmonary adenomas, 8 spindle cell sarcomas, 3 epitheliomas, 1 polymorphous cell sarcoma, 1 mammary tumor, 1 sarcoma.
[681] 32 leukemias, 6 thymic tumors, 3 spindle cell sarcomas, 4 epitheliomas, 1 plasmacytoma, 1 granulosa cell tumor of ovary, 1 mammary carcinoma.
[682] 1 granulosa cell tumor of ovary, 8 thymic tumors, 1 leukemia, 1 reticulum cell sarcoma of liver.
[684] 11 thymic tumors, 12 pulmonary adenomas.
[685] 11 thymic tumors, 2 leukemias, 1 mammary carcinoma, 2 lung adenomas.
[686] 1 generalized leukemia, 1 pulmonary adenoma, 1 mammary tumor, 2 sarcomas.
[691] 1 leukemia, 5 pulmonary adenomas.
[694] 1 leukemia, 2 pulmonary adenomas, 1 sarcoma.
[696] 1 pulmonary adenoma, 8 leukemias, 9 thymic tumors, 7 spindle cell sarcomas, 1 epithelioma, 1 lymphosarcoma, 2 granulosa cell tumor of ovary.
[697] 10 leukemia, 6 thymic tumors, 2 spindle cell sarcomas, 1 epithelioma, 1 testis carcinoma (embryoma), 1 pulmonary adenoma.
[698] Multiple papillomas, beginning at ca. 14 weeks; incidence: 90% at 18 weeks.
[699] First at ca. 10 weeks; incidence: 90% at ca. 17 weeks.

Reference	Animal	Strain or type	Sex	Preparation and dose	Site and route	Animals with tumors	Survival	Duration of experiment
542.--9,10-DIMETHYL-1,2-BENZANTHRACENE--Continued								
Berenblum and Shubik, 1949a	400 mice	Swiss (MRC)	F	0.06-1.5% in mineral oil once, followed by 5% croton oil in mineral oil twice weekly for 25 wks.	Skin	140 pap.[700]	----	29 wks.
	25 mice	Swiss (MRC)	F	1.5% in mineral oil once	Skin	0	----	29 wks.
Berenblum and Shubik, 1949b	25 mice	Swiss (MRC)	F	1.5% in mineral oil once after an interval of 43 wks. 5% croton oil in mineral oil twice weekly for 17 weeks.	Skin	9 pap.[704]	23 alive at 43 wks.	61 wks.
Dyad'kova, 1949	47 rats	----	----	0.5 - 3 mg. (Also injected at same site with cell-free filtrate of induced tumor)	S.C.	Sarc.[705]	6 died at 42 d.	At least 225 d.
	Rats	----	----	0.2% in sunflower seed oil, 0.5-3.5 mg. dose	S.C.	17 sarc.[706]	----	Over 225 d.
Edwall and Setälä, 1949	10 mice	Mixed	----	0.25% in anhydrous lanolin 3 times weekly	Skin	90% pap. and epi.	----	At least 90 d.
	10 mice	Mixed	----	0.03% in acetone 3 times weekly	Skin	100% pap. and epi.	----	At least 70 d.
	10 mice	Mixed	----	2500 mg. in 1000 cc. ethyl alcohol containing 20% sodium chlorate 3 times weekly	Skin	90% pap. and epi.	----	At least 90 d.
	10 mice	Mixed	----	0.25% in carbowax 1500 3 times weekly	Skin	100% pap. and epi.	----	At least 130 d.
Rask-Nielson, 1949	306 mice	Street	M&F	0.5 mg. in solid and liquid paraffin, 0.01 cc.	S.C.	80[707]	44 alive at 9 mos.	21 mos.
Rauschenbakh, 1949	10 hens	White	F	0.3 ml. 1% soln. in chicken fat weekly (each hen received 6 mg.)	S.C.	0	----	14 mos.
	120 mice	White	M&F	1 ml. in rabbit fat, 1% soln., single injection.	S.C.	Tumors[708]	68 alive at 4 mos.	At least 4 mos.
Setälä, 1949a	10 mice	Mixed	M&F	0.3% in acetone 3 times weekly	Skin	100% pap. and epi.	----	45 d.
	10 mice	Mixed	M&F	0.25% in Carbowax 1500, 3 times weekly	Skin	100% pap. and epi.	----	130 d.
	10 mice	Mixed	M&F	0.3% in dioxane 3 times weekly	Skin	90% pap. and epi.	----	65 d.
	10 mice	Mixed	M&F	2 mg. in 0.5 cc. Carbowax	S.C.	Sarc.	----	----
Setälä, 1949b	Mice	----	M&F	0.07% in aqueous suspension with Triton NE, 3 times weekly for 110 d.	Skin	100%[709]	----	----

[700] Average latent period at least 10.6 weeks.
[704] Average latent period 9.1 weeks.
[705] Latent period 124-163 days (average 150 days).
[706] 113-225 days (average 156 days).
[707] Leukemias and thymic tumors.
[708] 32 animals developed sarcoma in 4-5 months. Also 9 of these animals developed 3 lymphocytic leukosis, 5 myeloid leukosis and 1 hematocytoblastic leukosis.
[709] At the 16th week.

Reference	Animal	Strain or type	Sex	Preparation and dose	Site and route	Animals with tumors	Survival	Duration of experiment
542.--9, 10-DIMETHYL-1, 2-BENZANTHRACENE--Continued								
Setälä, 1949b	Mice	----	M&F	0.3% in dioxane 3 times weekly for 130 d.	Skin	100%	----	At least 130 d.
	Mice	----	M&F	0.25% in anhydrous lanolin 3 times weekly for 110 d.	Skin	90%[710]	----	At least 110 d.
	Mice	----	M&F	0.25% in Carbowax 3 times weekly for 130 d.	Skin	100%[711]	----	At least 130 d.
	Mice	----	M&F	0.3% in acetone 3 times weekly for 50 d.	Skin	90%	----	At least 50 d.
	Mice	----	M&F	0.3% in acetone 3 times weekly for 10 d.	Skin	40%	----	At least 10 d.
Setälä and Ekwall, 1949	Mice	----	----	0.07% in Triton NE, 3 times weekly	Skin	Tumors[712]	----	At least 9 wks.
Smith, 1949	Mice	C	----	0.05 cc. of a 0.5% soln. in tricaprylin, plus 0.05 cc. embryo skin suspension	I.M.	Tumors[713]	Very toxic	----
Bauer and Byrne, 1950	6 mice	C57	M&F	0.3 mg. of 20% carcinogen in beeswax pellets, four 20 gauge pellets 3 mm. long.	Parotid and submaxillary gland	3[714]	----	36 wks.
	5 mice	C	M	0.3 mg. of 20% carcinogen in beeswax pellets, four 20 gauge pellets 3 mm. long	Parotid and submaxillary gland	2[714]	----	27 wks.
	2 mice	A	M	0.3 mg. of 20% carcinogen in beeswax pellets, four 20 gauge pellets 3 mm. long	Parotid and submaxillary gland	1[715]	----	38 wks.
	4 rabbits	----	----	1.2 mg. of a 20% soln. in beeswax pellets (2 - 3 pellets of 1.2 mg. each)	Parotid duct	0	Sacrificed at intervals	1.5 yrs.
	4 rabbits	----	----	Pellets, 20% in beeswax	Parotid duct	0	Sacrificed at intervals	1.5 yrs.
	2 mice	A, C, & C57	----	0.3 mg. of 20% beeswax pellets, 4 pellets	Parotid and submaxillary glands	Tumors[716]	----	Over 3 mos.
Byrne and Bauer, 1950	Rabbits	----	----	Pellets	Parotid gland	0	Sacrificed at 3, 6, 9 and 12 mos.	12 mos.
Levy and Ring, 1950a	Hamsters	----	----	Pellets or crystals	Mandible cavity	Tumors[717]	----	----
Levy and Ring, 1950b	10 hamsters	----	----	0.5 mg. crystals or 0.6 mg. as pellets in paraffin or beeswax	Mandible cavity	8 sarc.[718]	----	At least 5 mos.
	10 hamsters	----	----	0.5 mg. crystals	Subgingival implant	Tumors[719]	----	At least 5 mos.

[710] At the 13th week.
[711] At 18 week.
[712] 100% skin tumors (papillomas and epitheliomas). Average latent period 9 weeks.
[713] 1 sarcoma.
[714] Adeno-acanthomas.
[715] Undifferentiated carcinoma.
[716] Adeno-acanthoma, adenoma, papillary cystadenoma, undifferentiated carcinoma and giant cell carcinoma of salivary glands. Some metastases of lungs.
[717] 80% fibrosarcomas in 4-5 months.
[718] Spindle cell. 4-5 months latent period.
[719] 8 fibrosarcomas. 4-5 months latent period.

Reference	Animal	Strain or type	Sex	Preparation and dose	Site and route	Animals with tumors	Survival	Duration of experiment
542.--9,10-DIMETHYL-1,2-BENZANTHRACENE--Continued								
Linell, 1950	25 rabbits	White market	----	0.5% in acetone, 6 applications twice weekly[720]	Skin right ear only[721]	14 pap.	----	33 d.
Linell and Nordén, 1950	25 rabbits	Stock	M&F	0.5% in acetone twice weekly, 17 applications[722]	Skin ear and back	Tumors[723]	10 killed at 4 mos.	7.5 mos.
Rask-Nielson, 1950a	57 mice	Street	M&F	0.02 mg. in 0.01 cc. paraffin	Mammary region	3[726]	6 alive at 12 mos.	18 mos.
	108 mice	Street	M&F	0.02 mg. in 0.01 cc. paraffin	Lung	10[727]	34 alive at 12 mos.	27 mos.
	68 mice	Street	M&F	0.02 mg. in 0.01 cc. paraffin, injected into thymus	S.C.	12[728]	15 alive at 12 mos.	30 mos.
Rask-Nielson, 1950b	83 mice	Street	M&F	0.5 mg. in 0.01 cc. paraffin	Lung	11[729]	3 alive at 12 mos.	15 mos.
Rask-Nielson, 1950c	306 mice	Street	M&F	0.5 mg. in 0.01 cc. paraffin	S.C.	Tumors[724]	20 alive at 12 mos.	21 mos.
	345 mice	Street	M&F	0.5 mg. in 001 cc. paraffin	Mammary region	27[725]	12 alive at 12 mos.	21 mos.
Saxén et al., 1950b	56 mice	X and Street	M&F	0.6 mg. in 10% soln. of Triton-N (total dose 1.65 to 1.85 mg.)	P.O.[23]	13 pap., 17 epi.[730]	46 alive at 3 mos.	At least 115 d.
	30 mice	X	M	0.3 mg. per cc. in 20% sodium cholate (total dose 1.5 to 1.65 mg.)	P.O.[23]	13 pap. 7 epi.[730]	24 alive at 3 mos.	At least 140 d.
	14 mice	X	M&F	0.02 mg. per cc. in 10% sodium oleate, 0.2 cc. weekly for 6 mos. (total dose 4 mg.)	P.O.[23]	1 epi. 7 pap.[730]	10 alive at 3 mos.	At least 215 d.
	14 mice	X	M	0.2 mg. per cc. in 20% sodium myristyl sulphate, 0.4 cc. bi-weekly for 1 mo., 0.2 cc. for another (total dose 0.6 mg.)	P.O.[23]	1 epi.[730]	1 alive at 3 mos.	At least 115 d.
	9 mice	----	M	0.6 mg. per cc. in 10% Triton-N (total dose 1.25 mg.)	P.O.[23]	6 pap., 2 epi.[730]	----	7 mos.
	9 mice	----	M	0.3 mg. per cc. in 5% Triton-N (total dose 0.6 mg.)	P.O.[23]	5 pap., 3 epi.[730]	----	7 mos.
	9 mice	----	M	0.15 mg. per cc. in 2.5% Triton-N (total dose 0.3 mg.)	P.O.[23]	6 pap.[730]	----	7 mos.
	9 mice	----	M	0.3 mg. per cc. in 10% olive oil (total dose 1.26 mg.)	P.O.[23]	0	----	7 mos.
	9 mice	----	M	0.3 mg. per cc. in 10% olive oil plus 0.05% Aerosol O.T. (total dose 1.26 mg.)	P.O.[23]	0	----	7 mos.
	9 mice	----	M	0.3 mg. per cc. in 10% olive oil plus 1.0% Aerosol O.T. (total dose 1.26 mg.)	P.O.[23]	1 epi., 7 pap.[730]	----	7 mos.
	9 mice	----	M	0.014 mg. in 1% Aerosol O.T. (total dose 0.059 mg.)	P.O.[23]	0	----	7 mos.

[23] Stomach tube.
[720] Skin disc removed.
[721] Other ear treated with benzpyrene.
[722] Painted on the opposite side with 3, 4-benzpyrene.
[723] 135 papillomas, 67 "carcinomatoids" (2 malignancies with metastases). First tumor at 4 weeks.
[724] 26 sarcomas, 2 squamous cell carcinomas.
[725] 21 sarcomas, 6 squamous cell carcinomas.
[726] 1 spindle cell sarcoma, 1 lymphosarcoma, 1 mammary carcinoma.
[727] 12 thymic lymphosarcomas, 8 pulmonary adenomas, 1 spindle cell sarcoma.
[728] 9 thymic lymphosarcomas, 2 pulmonary adenomas, 1 mammary carcinoma.
[729] 2 pulmonary adenomas, 9 thymic lymphosarcomas.
[730] Of the forestomach.

Reference	Animal	Strain or type	Sex	Preparation and dose	Site and route	Animals with tumors	Survival	Duration of experiment
542.--9,10-DIMETHYL-1,2-BENZANTHRACENE--Continued								
Saxén et al., 1950a	14 mice	Mixed	M&F	0.3 mg. per ml. with 5% Triton-N 100; 0.4 cc. twice weekly for 1 mo. followed by 0.06 cc. for 1 mo., then 0.03 cc. once weekly for 1 mo.	P.O.[23]	2 pap., 5 epi.[730]	6 alive at 150 d.	More than 150 d.
Setälä and Ekwall, 1950	Mice	----	M&F	0.03 to 0.3% in acetone, 3 times per wk.	Skin	Tumors[731]	----	At least 15 wks.
	Mice	----	M&F	0.03 to 0.3% in dioxane, 3 times per wk.	Skin	Tumors[731]	----	At least 15 wks.
	35 mice	----	M&F	0.25 to 0.3% in Carbowax 1500, 3 times per week	Skin	Tumors[731]	----	At least 18 wks.
	20 mice	----	M&F	0.25 to 0.3% in aqueous lanolin, 3 times per week	Skin	Tumors[731]	----	At least 17 wks.
	20 mice	----	M&F	0.25 to 0.3% in anhydrous lanolin, 3 times per wk.	Skin	Tumors[731]	----	At least 15 wks.
	10 mice	----	M&F	About 0.07% in Triton aqueous soln., 3 times per wk.	Skin	Tumors[731]	----	At least 13 wks.
	30 mice	----	M&F	About 0.03% in aqueous soln. of sodium cholate, 3 times per wk.	Skin	Tumors[731]	----	At least 12 wks.
	20 mice	----	M&F	About 0.03% in aqueous soln. of sodium myristyl sulphate, 3 times per wk.	Skin	Tumors[731]	----	At least 19 wks.
	20 mice	----	M&F	About 0.03% in aqueous soln. of sodium oleate, 3 times per wk.	Skin	Tumors[731]	----	At least 20 wks.
Shubik, 1950b	30 mice	CF1	F	1 application of 1.5% in mineral oil, followed in 3 wks. by 0.1% in a 5% soln. of croton oil in mineral oil for 20 wks.	Skin	19 epi., 5 pap.	30 alive at time of 1st tumor	38 wks.
	30 mice	CF1	F	1 application of 1.5% in mineral oil, followed by 5% croton oil in mineral oil for 35 wks. twice weekly	Skin	16 pap., 2 epi.	30 alive at time of first tumor.	48 wks.
	30 mice	CF1	F	1.5% in mineral oil once followed after 3 wks. by 0.1% in mineral oil twice weekly for 20 wks.	Skin	21 epi., 4 pap.	26 alive at time of first tumor	38 wks.
Shubik, 1950a	10 mice	Swiss	----	1.5% in mineral oil once, followed by 20% turpentine in mineral oil twice weekly for 20 wks.	Skin	0	----	23 wks.
	10 mice	Swiss	----	1.5% in mineral oil once, followed by 0.3% acridine in mineral oil twice weekly for 20 wks.	Skin	0	----	23 wks.
	10 mice	Swiss	----	1.5% in mineral oil, followed by 0.5% fluorene in mineral oil twice weekly for 20 wks.	Skin	0	----	23 wks.

[23] Stomach tube.
[730] Of the forestomach.
[731] Skin tumors in all surviving animals.

Reference	Animal	Strain or type	Sex	Preparation and dose	Site and route	Animals with tumors	Survival	Duration of experiment
542.--9, 10-DIMETHYL-1, 2-BENZANTHRACENE--Continued								
Shubik, 1950a	10 mice	Swiss	----	0.5% in mineral oil once, followed by 0.5% phenanthrene in mineral oil twice weekly for 20 wks.	Skin	0	----	23 wks.
	10 mice	Swiss	----	0.5% in mineral oil once, followed by castor oil twice weekly for 20 wks.	Skin	0	----	23 wks.
	10 mice	Swiss	----	1.5% in mineral oil once, followed by ricinoleic acid twice weekly for 20 wks.	Skin	0	----	23 wks.
	10 mice	Swiss	----	1.5% in mineral oil once, followed by glyceryl monoricinoleate twice weekly for 20 wks.	Skin	0	----	23 wks.
	10 mice	Swiss	----	1.5% in mineral oil once, followed by oleic acid twice weekly for 20 wks.	Skin	0	----	23 wks.
	10 mice	----	----	1.5% in mineral oil, followed by silver nitrate (10% aqueous) twice weekly for 20 wks.	Skin	0	----	23 wks.
	4 rabbits	----	----	1.5% in mineral oil, followed by wound healing	Skin	2 pap.	----	24 wks.
	4 rabbits	----	----	1.5% in mineral oil once, followed by 20% turpentine in mineral oil twice weekly for 20 wks.	Skin	0	----	24 wks.
	4 rabbits	----	----	1.5% in mineral oil once, followed by 5% croton oil in mineral oil for 20 wks., twice weekly	Skin	0	----	24 wks.
	4 rabbits	----	----	1.5% in mineral oil once, followed by chloroform twice weekly for 20 wks.	Skin	0	----	24 wks.
	4 rabbits	----	----	1.5% in mineral oil once, followed by 5% arsenic trioxide in Lanette wax SX twice weekly for 20 wks.	Skin	0	----	24 wks.
	4 rabbits	----	----	1.5% in mineral oil once, followed by arsenic pentoxide in Lanette wax SX twice weekly for 20 wks.	Skin	0	----	24 wks.
	20 rats	----	----	1.5% in mineral oil 3 times at 2 weekly intervals, followed by 5% croton oil in mineral oil for 30 wks., twice weekly	Skin	0	----	36 wks.
	20 guinea pigs	----	----	1.5% in mineral oil, either one or three applications, followed by 5% croton oil in mineral oil twice weekly for 36 wks.	Skin[732]	0	----	36 wks.
	20 guinea pigs	----	----	1.5% in minteral oil, either 5 or 10 applications, followed by 5% croton oil in mineral oil twice weekly for 36 wks.	Skin[732]	0	----	42 wks.
Sissons, 1950b	Rats	Inbred	----	Pellets in wax or cholesterol	Bone cavity	Tumors[733]	----	2 yrs.
	Mice	Inbred	----	Pellets in wax or cholesterol	Bone cavity	Tumors[733]	----	2 yrs.
Andres, et al., 1951	Mice	----	----	0.05% soln. in benzol daily	Skin	Tumors[734]	----	At least 30 wks.

[732] Skin badly ulcerated.
[733] Anaplastic sarcoma in bones.
[734] First papilloma at 14 wks., first cancer at 21 weeks.

Reference	Animal	Strain or type	Sex	Preparation and dose	Site and route	Animals with tumors	Survival	Duration of experiment
542.--9, 10-DIMETHYL-1, 2-BENZANTHRACENE--Continued								
Bergol'ts and Il'yina, 1951	60 mice	CC57	----	2 mg. in 0.5 cc. peach oil	S.C.	Tumors[735]	Killed at various periods	At least 240 d.
Engelbreth-Holm and Iversen, 1951	302 mice	St/EH	M&F	0.1 - 1.5% in benzene once	Skin	139 paps.	----	3 mos.
Geyer, et al., 1951	30 rats	Sprague-Dawley	F	Fat emulsion with 0.25% Triton, 0.0429% DMBA, 13 weekly injections (total dose DMBA 6.4 mg.)	I.V.	Tumors[736]	23 alive at 19 wks.	32 wks.
	122 rats	Sprague-Dawley	F	Fat emulsion with 1.0% Demal-14, 0.0429% DMBA, 10 - 13 weekly injections (total dose DMBA 3.3 - 5.5 mg.)	I.V.	Tumors[737]	71 alive at 19 wks.	32 wks.
Graffi, 1951	Rabbits	----	----	1% in acetone, twice weekly for 8 wks.	Skin	14 tumors	----	200 d.
	Rabbits	----	----	1% in acetone twice weekly, plus 10% croton oil in acetone, twice weekly	Skin	167 tumors	----	18 wks.
	Rabbits	----	----	0.5% soln. in acetone, twice weekly, 10 Paintings, followed by 10% soln. of croton oil in acetone, twice weekly	Skin	64 tumors	----	325 d.
	Rabbits	----	----	1% in acetone twice weekly for 8 wks., plus 10% croton oil in acetone, twice weekly for 8 wks.	Skin	66 tumors	----	200 d.
	150 mice	White	----	0.5% in acetone	Skin[738]	Tumors	----	----
	Rabbits	----	----	0.5% soln. in acetone, twice a week	Skin	14 tumors	----	18 wks.
Hill et al., 1951	70 mice	CAF_1	M&F	0.2% in mineral oil twice weekly	Skin	68 pap. and epi.	23 wks. avg.	At least 23 wks.
Levy et al., 1951	73 mice	Swiss	M	0.6 - 4.0% in benzene once	Mucosa of the lip[738a]	0	Killed at various intervals	Up to 32 d.
Rask-Nielsen and Gormsen, 1951	Mice	Street	----	0.5 mg.	S.C.	Tumors[739]	----	----
Ritchie, 1951	75 mice	Swiss	F	1.5% in mineral oil once, followed by 5% croton oil in mineral oil twice weekly. Also injected with adrenalin in painted area four times.	Skin	54 pap.	55 alive at 9 wks.	42 wks.
	50 mice	Swiss	F	1.5% in mineral oil once, followed by 5% croton oil in mineral oil twice weekly	Skin	33 paps.	36 alive at 12 wks.	42 wks.
	50 mice	Swiss	F	1.5% in mineral oil once, followed by 5% croton oil twice weekly. Also adrenalin injected previous to each application of croton oil	Skin	29 paps.	32 alive at 12 wks.	42 wks.
Salaman and Gwynn, 1951	16 mice	S	M&F	0.3 ml. of a 0.15% soln. in acetone, 101 d. interval followed by 0.3 ml. 2.5% croton oil in mineral oil weekly	Skin	Tumors[740]	12 alive at 227 d.	250 d.

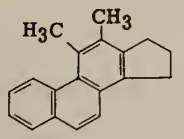
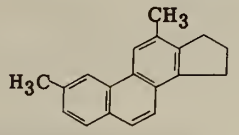
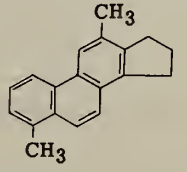
[735] 5 papillomas, 11 sarcomas recorded in mice at 90-130 days, 3 sarcomas in mice at 130-240 days.
[736] 24 rats with skin and other tumors.
[737] 71 with skin and other tumors.
[738] One drop on skin in back.
[738a] A histological study.
[739] Plasmacytomas.
[740] Multiple. No other details.

Reference	Animal	Strain or type	Sex	Preparation and dose	Site and route	Animals with tumors	Survival	Duration of experiment
542.--9,10-DIMETHYL-1,2-BENZANTHRACENE--Continued								
Salaman and Gwynn, 1951	16 mice	S	M&F	0.3 ml. of a 0.15% soln. in acetone once	Skin	0	----	252 d.
	16 mice	S	M&F	0.3 ml. of a 0.15 soln. in acetone once, interval of 101 d. followed by weekly applications of 0.15% in mineral oil.	Skin	Tumors[740]	11 alive at 227 d.	250 d.
Whiteley and Ghadially, 1951	6 rabbits	Agouti	----	2% in lanolin twice weekly for 2 wks. and then once weekly for 12 wks.	Skin	5 pap., 1 epi.	----	At least 89 d.
Iversen et al., 1952	126 mice	St/EH	M&F	0.1 - 0.5% in benzene once, followed after 80 days by croton oil, twice weekly for 12 wks.	Skin	97 tumors[741]	----	Over 160 d.
Linell and Nordén, 1952a	50 rabbits	Stock	----	5 mg. per ml. in acetone for 9 - 15 applications	Skin, ears	Tumors[742]	----	At least 145 d.
Linell and Nordén, 1952b	5 rabbits	White market	M	5 mg. per ml. in acetone, 2 application and then 5 applications with 10 mg. per ml.	Skin, inguinal folds	0	----	113 d.
	4 rabbits	White market	M	5 mg. per ml. in acetone, 26 applications, and then 5 applications of 10 mg. per ml., no treatment for 6 wks. and treatment then repeated. Inguinal sebaceous gland removed on right side between treatments.	Skin, inguinal folds	Pap.[743]	----	445 d.
	4 rabbits[744]	White market	M	5 mg. per ml. in acetone, 26 applications and then 5 applications of 10 mg. per ml., no treatment for 6 wks., then 14 applications of 10 mg. per ml. for 52 d. Large brown inguinal gland on the right side removed between treatments.	Skin, inguinal folds	Pap.[743]	----	582 d.
Mosinger, 1952	Guinea pigs	----	----	200 -300 mg. pellet	S.C.[745]	2 sarc.[746]	----	163-278 d.
Salaman, 1952	14 mice	Stock albino	M&F	0.3 ml. of a 0.15% soln. in acetone once, followed after a 6 wk. interval by a single application of 0.3 ml. of a 2.5% soln. of croton oil in mineral oil	Skin	0	----	----
	30 mice	Stock albino	M&F	0.3 ml. of a 0.15% soln. in acetone once, followed after a 6 wk. interval by a single application of croton oil, 0.3 ml. of a 2.5% soln. in mineral oil	Skin	17 pap.	2 died by 12 wks.	At least 122 d.
	14 mice	Stock albino	M&F	0.3 ml. of a 0.15% soln. in acetone, followed after a 6 wk. interval by weekly applications of croton oil, 0.3 ml. of a 2.5% soln. in mineral oil for 4 wks., and then an interval of 9 wks. followed by 4 more weekly applications.	Skin	100% pap.[747]	----	45 wks.

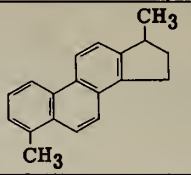
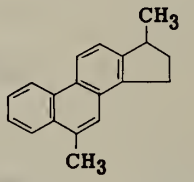
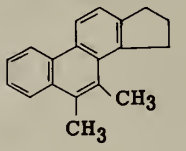
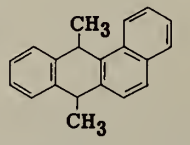
[740] Multiple. No other details.
[741] Type not specified.
[742] Skin tumors in 43 rabbits, type not specified.
[743] On surrounding skin only.
[744] Large sebaceous gland was removed from the right inguinal fold.
[745] Implanted under mammary gland.
[746] 1 spindle cell.
[747] Multiple tumors.

Reference	Animal	Strain or type	Sex	Preparation and dose	Site and route	Animals with tumors	Survival	Duration of experiment
542.--9, 10-DIMETHYL-1, 2-BENZANTHRACENE--Continued								
Salaman, 1952	14 mice	Stock albino	M&F	0.3 ml. of a 0.15% soln. in acetone, followed after a 6 wk. interval by a single application of croton oil (0.3 ml. of a 1.25% soln. in mineral oil)	Skin	----	----	----
Saxén, 1952	18 mice	C57 BR	M&F	Aqueous with Triton X-100, 0.09 mg. 3 times weekly for 10 wks.	P.O.[23]	Tumors[748]	----	6 mos.
Andreasen and Engelbreth-Holm, 1953	124 mice	St/EH	M&F	0.5% in benzene, 0.05 ml. applied once.[749]	Skin	43 pap.	----	70 d.
Engelbreth-Holm and Asboe-Hansen, 1953	35 mice	St/EH	M&F	0.05 ml. of a 0.5% soln. in benzene once, 0.2 mg. of cortisone daily, I.P.	Skin	17 pap.[750]	----	8 wks.
	30 mice	St/EH	M&F	0.05 ml. of a 0.5% soln. in benzene, once.	Skin	27 pap.[751]	----	8 wks.
Engelbreth-Holm and Jensen, 1953	535 mice[752]	dba/EH	M&F	0.05 ml. of 1.5% soln. in benzene, once.	Skin	211 pap., 15 epi.[753]	----	90 d.
	228 mice[754]	St/EH	M&F	0.05 ml. of a 0.5% soln. in benzene, once	Skin	124 pap.[755]	----	80 d.
Geyer et al., 1953	Rats	Sprague-Dawley	F	0.44 mg. per ml. emulsion, 0.5 ml. doses to a total of 4.3 mg. in 13 wks.	I.V.	75% tumors[756]	----	52 wks.
Gwynn and Salaman, 1953	16 mice	"S" stock albino	----	0.1% in acetone, followed by croton oil 0.5% in acetone weekly for 20 wks.	Skin	12 pap.[757]	16 alive at 25 wks.	25 wks.
	13 mice	"S" stock albino	----	0.15% in acetone, followed by 0.5% croton oil in acetone twice weekly for 12 wks., then weekly for 15 wks.	Skin	5 pap.[758]	5 alive at 30 wks.	30 wks.
	12 mice	"S" stock albino	----	0.15% in acetone, followed by acetone twice weekly for 12 wks., then weekly for 15 wks.	Skin	1 pap.	12 alive at 30 wks.	30 wks.
	28 mice	"S" stock albino	----	0.1 or 0.15% in acetone once	Skin	2 pap.	----	----
Salaman and Roe, 1953	20 mice	Stock albino "S"	M	0.3 mg. in acetone once	Skin	0	20 alive at 22 wks.	22 wks.
	20 mice	Stock albino "S"	M	0.3 mg. in acetone once, followed by 0.5% croton oil in acetone weekly for 18 wks.	Skin	104 pap.	18 alive at 22 wks.	22 wks.
Shubik and Ritchie, 1953	300 mice	Swiss	F	0.2% in mineral oil once, or twice, and 3 times at weekly intervals, followed by 5% croton oil in mineral oil for 36 wks.	Skin	175 pap.	263 alive at time of first tumor	41 wks.

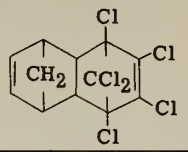
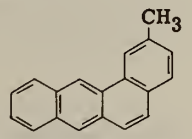
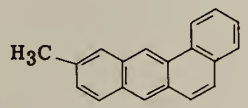
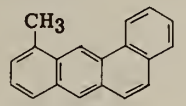
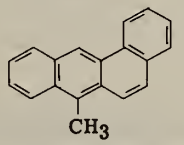
[23] Stomach tube.
[748] 12 squamous cell carcinomas of forestomach, 3 papillomas of forestomach, 1 pulmonary tumor.
[749] Skin biopsied at various times and papilloma occurrence correlated with hair growth cycle. Latent period 34.9 days.
[750] Average latent period 35.5 days.
[751] Average latent period 25.7 days.
[752] Various ages.
[753] Average latent period approximately 41 days.
[754] Different ages.
[755] Average latent period approximately 35 days.
[756] 8 adenocarcinomas of breast, 3 adenomas of breast, 2 fibroadenomas of breast, 4 squamous carcinomas of external ear.
[757] 189 total tumors.
[758] 26 total tumors.

Reference	Animal	Strain or type	Sex	Preparation and dose	Site and route	Animals with tumors	Survival	Duration of experiment
542.--9,10-DIMETHYL-1,2-BENZANTHRACENE--Continued								
Shubik and Ritchie, 1953	90 mice	C3H	M	1.0% in mineral oil once, or twice and 3 times at weekly intervals, followed by 5% croton oil in mineral oil twice weekly for 35 wks.	Skin	41 pap.	73 alive at time of first tumor	40 wks.
Shubik et al., 1953	100 mice	Swiss	F	0.5% in mineral oil twice weekly	Skin	799 pap.[759]	36 alive at 20 wks.	Over 20 wks.
543.--3,4-DIMETHYLCYCLOPENTENOPHENANTHRENE 								
Butenandt and Dannenberg, 1953	10 mice	Bl.H.	M&F	0.4% in benzene, 2 drops twice weekly	Skin	1 epi.	1 alive at 6 mos.	275 d.
544.--3,6-DIMETHYLCYCLOPENTENOPHENANTHRENE 								
Butenandt and Dannenberg, 1953	16 mice	Bl.H.	M	0.4% in benzene, 2 drops twice weekly	Skin	0	13 alive at 6 mos., 5 at 12 mos.	531 d.
	25 mice	----	M&F	0.4% in benzene, 2 drops twice weekly	Skin	0	8 alive at 6 mos. 1 at 12 mos.	506 d.
	9 mice	Bl.H.	M&F	5 mg. in 0.2 ml. sesame oil, 1 inj.	S.C.	0	1 alive at 6 mo.	195 d.
545.--3,8-DIMETHYLCYCLOPENTENOPHENANTHRENE 								
Butenandt and Dannenberg, 1953	14 mice	----	M&F	0.4% in benzene, 2 drops twice weekly	Skin	0	10 alive at 6 mos., 4 at 12 mos., 1 at 18 mos.	550 d.

[759] Total number of tumors; 100% bore tumors. Average latent period 8.6 weeks.

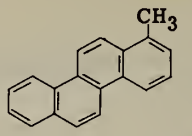
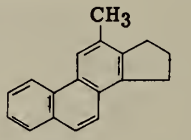
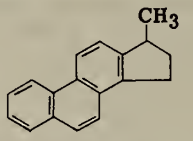
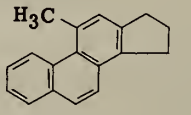
Reference	Animal	Strain or type	Sex	Preparation and dose	Site and route	Animals with tumors	Survival	Duration of experiment
546. --3',8-DIMETHYLCYCLOPENTENOPHENANTHRENE 								
Butenandt and Dannenberg, 1953	10 mice	----	M&F	0.4% in benzene, 2 drops twice weekly	Skin	0	3 alive at 9 mos.	9 mos.
547. --3',9-DIMETHYLCYCLOPENTENOPHENANTHRENE 								
Butenandt and Dannenberg, 1953	10 mice	Bl.H.	M&F	0.4% in benzene, 2 drops twice weekly	Skin	0	9 alive at 6 mos.	339 d.
	5 mice	Bl.H.	F	5 mg. in 0.2 ml. sesame oil, 1 inj.	S.C.	0	5 alive at 6 mos.	346 d.
548. --9,10-DIMETHYLCYCLOPENTENOPHENANTHRENE 								
Butenandt and Dannenberg, 1953	10 mice	----	M&F	0.4% in benzene, 2 drops twice weekly	Skin	0	8 alive at 6 mos., 1 alive at 12 mos.	457 d.
	11 mice	Bl.H.	F	0.4% in benzene, 2 drops twice weekly	Skin	2[760]	11 alive at 6 mos., 5 at 12 mos., 3 at 18 mos.	649 d.
549. --9,10-DIMETHYL-9,10-DIHYDRO-1,2-BENZANTHRACENE 								
Bergol'ts and Il'tina, 1951	30 mice	CC57	----	10 mg. in 0.5 cc. peach oil	S.C.	0	Killed at various periods	At least 360 d.

[760] Mammary carcinoma.

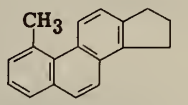
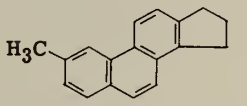
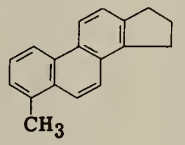
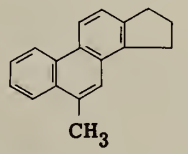
Reference	Animal	Strain or type	Sex	Preparation and dose	Site and route	Animals with tumors	Survival	Duration of experiment
550.--1,2,3,4,10,10-HEXACHLORO-1,4,4a,5,8,8a-HEXAHYDRO-1,4,5,8-DIMETHANONAPHTHALENE[761] 								
Ball et al., 1953	75 rats	Sprague-Dawley	F	5 - 20 p.p.m. in the diet	P.O.	0[761a]	----	64 wks.
551.--2'-METHYL-1,2-BENZANTHRACENE 								
Hill et al., 1951	20 mice	CAF_1	M&F	0.4% in mineral oil twice weekly for 33 wks.	Skin	1 pap.	19 alive at 54 wks.	68 wks.
552.--7-METHYL-1,2-BENZANTHRACENE 								
Hill et al., 1951	20 mice	CAF_1	M&F	0.4 in mineral oil twice weekly for 32 wks.	Skin	0	14 alive at 68 wks.	68 wks.
553.--8-METHYL-1,2-BENZANTHRACENE 								
Hill et al., 1951	20 mice	CAF_1	M&F	0.4% in mineral oil twice weekly for 68 wks.	Skin	0	14 alive at 68 wks.	68 wks.
554.--10-METHYL-1,2-BENZANTHRACENE 								
Lindner and Muller, 1954	10 rats	Wistar	F	Single injection of 3.2 mg. in 0.1 ml. tricaprylin	S.C.	3 sarc.	5 alive at 12 mos., 2 at 24 mos.	24 mos.

[761] Commercial adrin.

[761a] Detailed pathology to be reported elsewhere.

Reference	Animal	Strain or type	Sex	Preparation and dose	Site and route	Animals with tumors	Survival	Duration of experiment
555. --1-METHYLCHRYSENE[762] 								
Gough and Shoppee, 1952	Mice	----	----	----	Skin	0	----	----
	Mice	----	----	Grafted prostate tissue plus crystals	S.C.	0[763]	----	----
556. --3-METHYLCYCLOPENTENOPHENANTHRENE 								
Butenandt and Dannenberg, 1953	20 mice	Bl.H.	M&F	0.4% in benzene, 2 drops twice weekly	Skin	1[764]	7 alive at 6 mos.	272 d.
	17 mice	Bl.H.	M&F	5 mg. in 0.2 ml. sesame oil, 1 inj.	S.C.	0	1 alive at 6 mos.	249 d.
557. --3'-METHYLCYCLOPENTENOPHENANTHRENE 								
Butenandt and Dannenberg, 1953	25 mice	Bl.H.	M&F	0.4% in benzene, 2 drops twice weekly	Skin	1 sarc.	12 alive at 6 mos., 6 at 12 mos., 1 at 18 mos.	561 d.
	12 mice	Bl.H.	M&F	5 mg. in 0.2 ml. sesame oil, 1 inj.	S.C.	0	2 alive at 6 mos.	218 d.
558. --4-METHYLCYCLOPENTENOPHENANTHRENE 								
Butenandt and Dannenberg, 1953	9 mice	Bl.H.	M&F	5 mg. in 0.2 ml. sesame oil, 1 inj.	S.C.	0	8 alive at 6 mos., 2 at 12 mos.	405 d.

[762] Called 3-methyl chrysene in original paper.
[763] "Precancerous" proliferative changes.
[764] Mammary carcinoma.

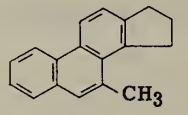
Reference	Animal	Strain or type	Sex	Preparation and dose	Site and route	Animals with tumors	Survival	Duration of experiment
558.--4-METHYLCYCLOPENTENOPHENANTHRENE--Continued								
Butenandt and Dannenberg, 1953	13 mice	Bl.H.	M&F	0.4% in benzene, 2 drops twice weekly	Skin	2[765]	12 alive at 6 mos., 1 at 12 mos.	433 d.
559.--5-METHYLCYCLOPENTENOPHENANTHRENE 								
Butenandt and Dannenberg, 1953	21 mice	----	M&F	0.4% in benzene, 2 drops twice weekly	Skin	0	5 alive at 6 mos., 1 at 12 mos.	490 d.
560.--6-METHYLCYCLOPENTENOPHENANTHRENE 								
Butenandt and Dannenberg, 1953	18 mice	Bl.H.	M&F	0.4% in benzene, 2 drops twice weekly	Skin	0	2 alive at 18 mos.	598 d.
	10 mice	----	M&F	0.4% in benzene, 2 drops twice weekly	Skin	0	7 alive at 6 mos.	359 d.
561.--8-METHYLCYCLOPENTENOPHENANTHRENE 								
Butenandt and Dannenberg, 1953	15 mice	----	M&F	0.4% in benzene, 2 drops twice weekly	Skin	0	8 alive at 6 mos., 5 at 12 mos., 1 at 18 mos.	714 d.
562.--9-METHYLCYCLOPENTENOPHENANTHRENE 								
Butenandt and Dannenberg, 1953	5 mice	Bl.H.	F	5 mg. in 0.2 ml. of sesame oil every other mo. (7 injections)	S.C.	1[766]	5 alive at 6 mos., 3 at 12 mos.	609 d.

[765] 1 papilloma, 1 epithelioma, plus 1 mammary carcinoma.

[766] Thymus tumor, none at injection site.

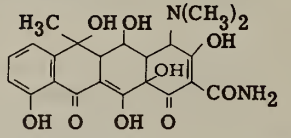
Reference	Animal	Strain or type	Sex	Preparation and dose	Site and route	Animals with tumors	Survival	Duration of experiment
562.--9-METHYLCYCLOPENTENOPHENANTHRENE--Continued								
Butenandt and Dannenberg, 1953	10 mice	Bl.H.	M&F	0.4% in benzene, 2 drops twice weekly	Skin	0	10 alive at 6 mos., 6 at 12 mos., 1 at 18 mos.	552 d.

563.--10-METHYLCYCLOPENTENOPHENANTHRENE



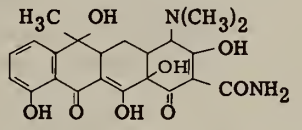
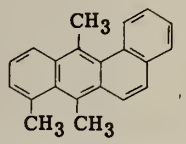
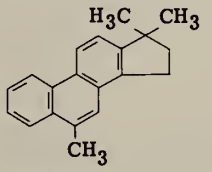
Butenandt and Dannenberg, 1953	35 mice	----	M&F	0.4% in benzene 2 drops twice weekly	Skin	5[767]	6 alive at 6 mos., 3 at 12 mos.	460 d.

564.--OXYTETRACYCLINE[768]



P'an et al., 1950b	7 cats	----	----	93 or 183 mg. per day (P.O.) or 38 mg. per day (I.M.)	P.O. I.M.	0	----	8 wk.
	Rats	----	----	100 - 200 mg. per kg. daily	P.O. I.M.	0	----	8 wks.
	Mice	----	----	75 - 150 mg. per kg. per day	P.O. I.M.	0	----	8 wks.
	4 dogs	----	----	75 - 370 mg. per kg. daily	P.O.	0	Sacrificed at 57 d.	57 d.
	5 dogs	----	----	38 - 75 mg. per kg. daily	I.M.	0	Sacrificed at intervals	77 d.
	4 dogs	----	----	50 - 100 mg. per kg. daily	I.M.	0	100% alive	90 d.
	7 dogs	----	----	93 - 465 mg. per kg. daily	P.O.	0	Sacrificed	56 d.
P'an et al., 1950a	40 mice	Rockland Swiss	----	80 mg. per kg. per d. or 160 mg. per kg. per d.	P.O.[23]	0	----	6 wks.
	40 rats	Sherman	----	80 or 160 mg. per kg. per d.	P.O.[23]	0	----	7 wks.
	4 cats	----	----	40 mg. per day	I.M.	0	1 died during experiment	65 d.

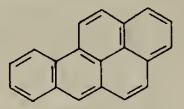
[23] Stomach tube.
[767] 1 papilloma, 4 epitheliomas.
[768] Sodium terramycin or terramycin hydrochloride.

Reference	Animal	Strain or type	Sex	Preparation and dose	Site and route	Animals with tumors	Survival	Duration of experiment
564.--OXYTETRACYCLINE--(Continued)								
P'an et al., 1950a	6 cats	----	----	40 or 80 mg. per kg. per d., micronized aqueous suspension	I.M.	0	1 died during experiment	95 d.
	7 dogs	----	----	40 - 240 mg. per kg. per d.	I.M.	0	3 died	77 d.
	4 dogs	----	----	80 - 400 mg. per kg. per d.	P.O.	0	----	57 d.
565.--TETRACYCLINE 								
Cuningham et al., 1953	8 dogs	Mongrel	----	10 or 100 mg. per kg. twice a day, 5 days per wk.	----	0	100% alive	3 mos.
566.--5,9,10-TRIMETHYL-1,2-BENZANTHRACENE 								
Burgoyne et al., 1950	58 mice	C57 black	M&F	0.06% in benzene twice weekly	Skin	12 pap., 52 epi.[768a] 9 sarc.	49 alive	Over 7 mos.
	73 mice	dba	M&F	0.06% in benzene twice weekly	Skin	39 pap., 43 epi.,[768b] 9 sarc.	30 alive	Over 7 mos.
	67 mice	dba x C57 black	M&F	0.06% in benzene twice weekly	Skin	21 pap., 61 epi.,[768a] 16 sarc.	43 alive	Over 7 mos.
	77 mice	C57 black x dba	M&F	0.06% in benzene twice weekly	Skin	28 pap., 66 epi.,[768a] 20 sarc.	64 alive at 7 mo.	At least 10.5 mos.
567.--3',3',9-TRIMETHYLCYCLOPENTENOPHENANTHRENE 								
Butenandt and Dannenberg, 1953	10 mice	Bl.H.	M	5 mg. in 0.2 ml. sesame oil, 1 inj.	S.C.	0	4 alive at 6 mos., 1 at 12 mos.	406 d.
	11 mice	Bl.H.	M&F	0.4% in benzene, 2 drops twice weekly	Skin	1[764]	8 alive at 6 mos., 3 at 12 mos.	483 d.

[764] Mammary carcinoma.

[768a] Some carcinomas and some sarcomas pigmented.

[768b] Some carcinomas and some sarcomas pigmented. One invasive carcinoma with pigment classified as a malignant melanoma.

Reference	Animal	Strain or type	Sex	Preparation and dose	Site and route	Animals with tumors	Survival	Duration of experiment
568.--3,4-BENZPYRENE 								
Mottram, 1938	20 mice	----	----	2 times weekly for 10 weeks, also with beta radiation	Skin	7 pap., 9 epi.	1 died	At least 150 d.
Engelbreth-Holm and Iversen, 1947	21 mice	Street	----	0.5% in benzene, 2 times weekly for 24 wks.	Skin	11 epi., 9 pap.	----	----
	20 mice	Street	----	0.5 mg. in peanut oil	S.C.	7 sarc.	----	----
Hartmann, 1947	30 rats	----	----	0.2 ml. of a soln. in benzene (0.5%) weekly	I.M.	30[769]	----	----
	12 rabbits	----	----	0.5% in benzene twice weekly	Skin ear	Epi.[770]	----	----
Tannenbaum and Silverstone, 1947	49 mice	Dba	M	0.3% in benzene, 19 applications in 9 wks. (Food ad libitum)	Skin	32 paps. & epi.	4 alive	56 wks.
	49 mice	Dba	M	0.3% in benzene, 50 applications in 18 wks. (ad libitum diet)	Skin	47 paps. & epi.	All dead at 31 wks.	31 wks.
	50 mice	Dba	M	0.3% in benzene, 19 applications in 9 wks. (Calorie restricted diet)	Skin	11 paps. & epi.	26 alive at 56 wks.	56 wks.
	48 mice	Dba	M	0.3% in benzene, 50 applications in 18 wks. (Calorie restricted diet)	Skin	43 paps. & epi.	3 alive at 31 wks.	31 wks.
Almasy, 1948	Mice	M	----	0.25 - 10% in benzene-lanolin, 2 times weekly	Skin	Tumors	----	At least 435 d.
Berg, 1948	150 mice	Dobrovolskaya-Zavadskaya	----	0.025% and 0.5% in acetone, 2 times weekly for 2 mos. Some animals also received lanolin	Skin	Carc., pap.	----	23 wks.
Caleff, 1948	8 rats	White	----	0.4 ml. of a 3% soln. (1.2 mg. of BP)	S.C.	3	8 alive at 179 d.	179 d.
Crabtree, 1948	30 mice	MRC/H hybrids	M&F	0.1% in ether plus 2% mineral oil, twice weekly for 20 wks.	Skin	Tumors[771]	----	----
Danchakov, 1948	Guinea pig embryo	----	----	0.06 mg. in oil	Inj. into allantoid cavity or in embryo itself	0	----	----
	Guinea pigs[772]	----	F	5 mg. every 5 d.	S.C.	0	----	----
Dunning et al., 1948a	20 rats	Fischer, Marshall, A x C	M&F	0.2 cc. of 1% in paraffin, 2 inj. (at different sites)	S.C.	18 sarc.[773]	20 alive at 80 d.	Average 217 d.
	120 rats[774]	Fischer, Marshall, A x C	M&F	0.2 cc. of 1% in paraffin, 2 inj.	S.C.	67 sarc.[775]	85 alive at 80 d.	150 - 210 d.

[769] At least 2 carcinomas.
[770] At least three after 225 wks.
[771] 29 mice with skin tumors, type not stated. Average latent period 16.0 weeks.
[772] Pregnant.
[773] Many bilateral sarcomas. Average latent period 184 days.
[774] Alloxan diabetic.
[775] Many with bilateral sarcomas. Average latent period at least 165 days.

Reference	Animal	Strain or type	Sex	Preparation and dose	Site and route	Animals with tumors	Survival	Duration of experiment
568.--3,4-BENZPYRENE--Continued								
Engel, 1948a	10 rats	----	----	0.5% in benzene for 9 mos.	Skin	1[776]	100% alive	9 mos.
	10 rats	----	----	1.5% in benzene, plus S.C. inj. every third day of an antitoxic liver extract	Skin	0	100% alive	9 mos.
Engel, 1948b	10 rats	White	M&F	0.5% soln., 3 times weekly	Skin	1[777]	----	9 mos.
	10 rats	White	----	0.5 soln. 3 times weekly, followed by Forbes-Neal extract S.C. (corresponding to 50μ fresh liver)	Skin	0	----	9 mos.
Gallico, 1948	20 rats	----	----	5 mg. in cod liver oil, once, plus 2 inj. of the oil only at the 9th and 11th wk.	S.C.	8	12 alive at 130 d.	130 d.
	12 rats	----	----	5 mg. in cod liver oil, once.	S.C.	2	7 alive at 130 d.	2 mos.
Golbert, 1948	100 rats	----	----	0.2 cc 0.5% in purified sunflower seed oil, 5 inj. at 2 to 3 wk. intervals (5 mg. total)	Tongue	Tumors[778]	30 died by 76 d.	Average 436 d.
Kupperman and Greenblatt, 1948	3 rats	----	F	10-15 mg. pellets	Uterus	0	----	180 d.
	4 rats	----	F	1 mg. in 0.05 cc. sesame oil every 2nd day (total 20 mg.)	S.C.	4 sarc.	----	185 d.
Pfeiffer and Allen, 1948	1 monkey	Rhesus	F, castr.	0.261 gm. in sesame oil	Left breast, uterus	0	----	8 mos.
	1 monkey	Rhesus	F, castr.	0.300 gm. paraffin pellets	Uterus, breasts, vagina	0	----	10 wks.
	1 monkey	Rhesus	F	0.464 gm. in sesame oil or melted paraffin, also given 110.00 gm. estrogen	Vagina, buttocks, ears, breast	0	----	2 yrs. 9 mos.
	2 monkeys	Rhesus	F	0.007 or 0.28 gm. in sesame oil, also given 0.085 or 7.05 gm. estrogen	Uterus, right breast	0	----	58 d. - 5 mos.
	6 monkeys	Rhesus	F, castr.	0.032-0.140 gm. in sesame oil, also given 0.10-16.05 gm. estrogen	Perivaginal, breasts, thighs, uterus, right tube, mammary duct, left nipple	0	----	4 wks. - 5 mos.
	1 monkey	Rhesus	F	0.350 gm. sesame oil	Uterus, right tube, breast, thigh	0	----	4 yrs., 3 mos.

[776] Myosarcoma.
[777] Multiple tumors in peritoneum (myosarcoma).
[778] 22 sarcomas of tongue (myosarcoma and fibrosarcoma), 10 sarcomas of connective tissue of neck and lymph nodes of neck, 1 malignant adenoma of salivary gland, and 1 adenoma of sebaceous gland. (A total of 34 tumors in 29 rats of 100 injected.)

Reference	Animal	Strain or type	Sex	Preparation and dose	Site and route	Animals with tumors	Survival	Duration of experiment
				568.--3,4-BENZPYRENE--Continued				
Pfeiffer and Allen, 1948	4 monkeys	Rhesus	M&F	0.012-0.430 gm. in sesame oil; also given 20-methylcholanthrene and 1, 2, 5, 6-dibenzanthracene	Abdomen, ear, breast, scrotum	0	----	7 wks.-10 mo.
	1 monkey	Rhesus	F	0.700 gm. in sesame oil or pellets, also 20-methylcholanthrene	Ear, breast abdomen	0	----	10 yrs., 6 mos.
	1 monkey	Rhesus	F, castr.	0.510 gm. in sesame oil, pellets, benzene; also 20-methylcholanthrene	Ear, breast	0	----	9 yrs.
	1 monkey	Rhesus	F	0.080 gm. pellets; also 20-methylcholanthrene	Serosa of stomach	0	----	3 yrs.
Schmidt, 1948	25 mice	White	----	0.5% in benzene twice weekly, plus 0.25 ml. (10 mg.) cytochrome soln. in saline twice weekly	Skin	9 paps. & 9 epi.	----	178 d.
	25 mice	White	----	0.5% in benzene twice weekly, plus 0.25 ml. saline twice weekly, S.C.	Skin	4 paps. & 5 epi.	----	155 d.
Berenblum, 1949	50 mice	C3H	F	0.5% in acetone, weekly painting	Skin	17 pap., 27 epi.[779]	19 alive	51 wks.
	25 mice	A	F	0.5% in acetone, weekly painting	Skin	11 pap., 3 epi.[780]	24 alive	34 wks.
	25 mice	C	F	0.5% in acetone, weekly painting	Skin	14 pap., 2 epi.[781]	18 alive	33 wks.
	25 mice	dba	F	0.5% in acetone, weekly painting	Skin	8 pap., 2 epi.[782]	19 alive	33 wks.
	25 mice	C57 black	F	0.5% in acetone, weekly painting	Skin	0	15 alive	38 wks.
	25 mice	CAF	F	0.5% in acetone, weekly painting	Skin	3 pap., 2 epi.	20 alive	38 wks.
Bergol'ts et al., 1949	76 mice	CC57	----	0.25-5.0 mg. in peach oil	S.C.	15 sarc.[783]	30 alive at 130 d.	226 d.
Boutwell et al., 1949a	288 mice	Rockland	F	0.3% in benzene twice weekly, 38 applications ([785])	Skin	54 pap., 139 epi.	----	173 d.
Boutwell et al., 1949b	48 mice	----	F	0.3% in benzene twice weekly, 44 applications	Skin	5 pap. & 25 epi.	39 alive at 119 d.	217 d.
	48 mice	----	F	0.3% in benzene twice weekly, 35 applications	Skin	13 pap. & 28 epi.	45 alive at 108 d.	178 d.
	336 mice	----	F	0.3% in benzene twice weekly, 35 or 44 application[784]	Skin	46 pap., 203 epi.	----	178 d. - 217 d.

[779] Average latent period 42 weeks.
[780] Average latent period 34 weeks.
[781] Average latent period 30 weeks.
[782] Average latent period 32 weeks.
[783] At site of injection. Average latent period 100-130 days.
[784] Various diets of vitamins.
[785] Various diets of high and low calories and fats.

Reference	Animal	Strain or type	Sex	Preparation and dose	Site and route	Animals with tumors	Survival	Duration of experiment
568.--3,4-BENZPYRENE--Continued								
Danchakov and Nicod, 1949	Guinea pig embryo	----	----	0.06 mg. in oil	Allantoid cavity	0	----	----
	Guinea pigs[772]	----	F	5 mg. every 5 d.	S.C.	0	----	----
De Ome et al., 1949	45 mice	C3H	----	0.1 mg. (0.1 ml. of 0.1%) in sesame oil, sesame free	S.C.	24 sarc.	----	8 mos.
	48 mice	C3H	----	0.1 mg. (0.1 ml. of 0.1%) in sesame oil with 1% sesame	S.C.	36 sarc.	----	8 mos.
Dunning et al., 1949a	82 rats[786]	----	----	0.2 cc. of a 1% soln. in paraffin	S.C.	67% sarc.	----	----
Hüter, 1949	15 rats	Albino	----	10 mg. in 0.5 ml. olive oil	S.C.	4[787]	----	12 - 61 wks.
Melczer, 1949	Mice	Mixed	----	0.5% plus 2.5% cholesterol, twice weekly for 5 mos.	----	0	----	At least 5 mos.
	Mice	Mixed	----	0.5% plus 2.5% lanolin	----	0	----	At least 5 mos.
Mueller, 1949	3 rabbits	----	F	Crystal	Ovaries	3[789]	----	----
Peacock et al., 1949	30 mice	Stock	----	0.1% in 0.3 ml. tricaprylin, 1 inj.	S.C.	7 sarc.	----	123-307 d.
Peacock and Peacock, 1949	16 fowls	Barred Plymouth Rock	----	Saturated soln. in chloroform, 42 applications	Skin, comb or wattle	0	----	2.5 yrs.
Rosenbohm, 1949a	340 mice	VI	----	0.10 - 1 mg. in oil	S.C.	Tumors[791]	----	At least 12 mos.
	464 mice	IX	----	0.1 - 1.0 mg. in oil	S.C.	Tumors[792]	----	At least 17 mos.
Rosenbohm, 1949b	618 mice	VI	----	0.1 - 0 mg. in oil	S.C.	343 sarc.	----	600 d.
	482 mice	IX	----	0.1 - 1.0 mg. in oil	S.C.	262 sarc.	----	120 - 600 d.
	109 mice	VII	----	1 mg. in oil	S.C.	69%	----	At least 165 d.
	35 mice	VII A VI	----	1 mg. in oil	S.C.	80%	----	At least 209 d.
	115 mice	IX A VI	----	1 mg. in oil	S.C.	76%	----	At least 137 d.
Silverstone and Tannenbaum, 1949	150 mice	dba	M	0.30% in acetone twice weekly for 12 or 14 applications. Thyroid diet until 8.5 or 9.5 wks.	Skin	102 pap., also epi.	----	48 wks.
	100 mice	dba	M	0.30% in acetone twice weekly for 12 or 14 applications	Skin	63 pap. and epi.	----	48 wks.
	100 mice	dba	M	0.30% in acetone twice weekly for 12 or 14 applications. Thyroid diet throughout experiment	Skin	52 pap. and epi.	----	48 wks.

[772] Pregnant.
[786] Chronic diabetic following Alloxan.
[787] Type not specified.
[789] Adenocarcinoma of uterus.
[791] Various percentage of lung tumors (12.8% spontaneous).
[792] Various percentage of lung tumors (3.3% spontaneous).

Reference	Animal	Strain or type	Sex	Preparation and dose	Site and route	Animals with tumors	Survival	Duration of experiment
568.--3,4-BENZPYRENE--Continued								
Smith, 1949	73 mice	C	----	0.05 cc. of a 0.5% soln. in tricaprylin, plus 0.05 cc. of embryo skin suspension	I.M.	Tumors[793]	----	254 d.
	Mice	C	----	0.025 cc. of a 1% soln. in olive oil, plus 0.025 cc. embryo skin and 0.075 cc. Locke soln. 31 implants in several mice.	I.M.	Tumors[794]	----	6 mos.
	Mice	C	----	0.025 cc. of a 2% soln. in olive oil, plus 0.025 cc. embryo skin and 0.075 cc. Locke soln. 22 implants in several mice.	I.M.	Tumors[795]	----	6 mos.
Tannenbaum and Silverstone, 1949a	75 mice	C57 black	M&F	0.15 mg. in 0.2 cc. lard[796]	S.C.	39 sarc.[797]	36 alive at 39 wks.	39 wks.
	102 mice	dba	M	0.3% in benzene twice weekly, 17 applications, 18 or 32% protein diet	Skin	60 epi. & pap.[798]	32 alive at 54 wks.	54 wks.
Tannenbaum and Silverstone, 1949b	49 mice	C57 black	M	0.15 mg. in 0.2 cc. lard	S.C.	30 sarc.	18 alive at 40 wks.	40 wks.
	45 mice	JAX Swiss	F	0.3% in benzene, 32 applications in 21 wks.	Skin	22 pap. & epi.[799]	----	42 wks.
	79 mice	JAX Swiss	F	0.15 or 1.5 mg. in 0.2 cc. of lard	S.C.	39 sarc.[800]	29 alive at 52 wks.	52 wks.
	40 mice	JAX ABC	F	0.1 mg. in 0.2 cc. lard	S.C.	7 sarc.[801]	29 alive at 52 wks.	52 wks.
Bonte, 1950	10 frogs	Rana Temporarial	----	0.2% in olive oil 3 times per wk. for 1 mo.	Skin	0	7 alive at 45 d.	45 d.
	33 frogs	Rana Temporarial	----	0.5 mg. pellet plus 0.25 mg. 4 times per os	S.C. P.O.	0	----	120 d.
	18 frogs	Rana Temporarial	----	1% in olive oil for 7 wks.	Skin	----	----	At least 7 wks.
Breedis, 1950	Salamander	Triturus viridescens	----	In vaseline, 1 inj.	S.C.	0	----	----
Engel, 1950	26 mice	([801a])	M&F	0.5% soln. in sesame oil, twice weekly	S.C.	10[802]	13 alive at 3 mos.	At least 3 mos.
	20 mice	([801a])	F	0.2 cc. of a 1.5% soln. in sterilized sesame oil, 2 weekly inj. for first 2 mos, then 1 inj. weekly	S.C.	7[802]	10 alive at 3 mos.	At least 3 mos.

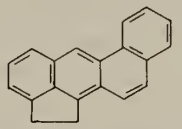
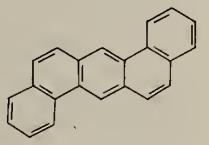
[793] 6 epitheliomas.
[794] 17 carcinomas, 3 carcinoma and sarcoma, 2 sarcomas.
[795] 5 carcinomas, 4 carcinoma and sarcoma, 6 sarcomas.
[796] Various percentages of protein in diet.
[797] Average latent period 24.4 weeks.
[798] Average latent period 34.3 or 39.4 weeks.
[799] Average latent period 24 weeks.
[800] Average latent period 18 or 25 weeks.
[801] Average latent period 28 weeks.
[801a] Carlos Finlay Institute of Special Studies.
[802] Fibrosarcomas, first tumor at about 3 mos.

Reference	Animal	Strain or type	Sex	Preparation and dose	Site and route	Animals with tumors	Survival	Duration of experiment
568.--3,4-BENZPYRENE--Continued								
Ferrari and Costa, 1950	11 rats	----	----	100 mg. per kg. of body wt.	S.C.	4	4 alive	170 d.
Graffi and Puhr, 1950	40 mice	White	M	Acetone soln. (0.5%), twice weekly	Skin	12 epi.	Sacrificed at intervals	----
Hammerschmidt and Korting, 1950	15 rats	Albino	M	10 mg. per 100 g. in 1 ml. olive oil	S.C.	12[803]	12 alive	3 mos.
Linell, 1950	50 rabbits	White market	----	0.5% in acetone, 6 applications twice weekly	Skin left ear[804]	0	----	33 d.
Linell and Nordén, 1950	25 rabbits	Stock	M&F	0.5% in acetone, twice weekly, 17 applications. Painted on the opposite side with 9, 10-Dimethyl-1,2-benzanthracene	Skin ear and back	9 pap.	----	7.5 mos.
Rask-Nielson, 1950a	66 mice	Street	M&F	0.02 mg. in 0.01 cc. paraffin	Lung	6[806a]	18 alive at 12 mos.	30 mos.
	58 mice	Street	M&F	0.02 mg. in 0.01 cc. paraffin	Thymus	2[808]	19 alive at 12 mos.	27 mos.
	59 mice	Street	M&F	0.02 mg. in 0.01 cc. paraffin	Mammary region	6[807]		
Rask-Nielson, 1950b	85 mice	Street	M&F	0.5 mg. in 0.01 cc. paraffin	Lung	8[806]	20 alive at 12 mos.	24 mos.
Rask-Nielson, 1950c	63 mice	Street	M&F	0.5 mg. in 0.01 cc. paraffin	Flank	17[805]	17 alive at 12 mos.	30 mos.
	58 mice	Street	F	0.5 mg. in 0.01 cc. paraffin	Mammary region	3[807a]	7 alive at 12 mos.	30 mos.
Rozynek, 1950	18 rats	White	M&F	0.1% in colza oil, plus various treatments	S.C.	12	----	91 d.
Salaman and Gwynne, 1950	5 mice	----	----	1% in acetone daily for 6 days, after 38 d. croton oil was applied.	Skin	0[808a]	----	Over 44 d.
	12 mice	----	M&F	0.3 cc. of a 1% acetone soln. once only, followed by repeated applications of croton oil	Skin	0[808b]	----	Over 110 d.
	12 mice	----	M&F	0.3 cc. of a 1% acetone soln. once, and once a week for 110 d.	Skin	0[808b]	----	Over 110 d.
	12 mice	----	M&F	0.3 cc. of a 1% acetone soln., once only	Skin	0	----	6 mos.
Sissons, 1950a	Mice	Inbred	----	Pellets in wax or cholesterol	Bone cavity	Tumors[809]	----	2 yrs.
	Rats	Inbred	----	Pellets in wax or cholesterol	Bone cavity	Tumors[809]	----	2 yrs.

[803] Not specified.
[804] Right ear of 25 rabbits treated with 9, 10-dimethyl-1,2-benzanthracene.
[805] 14 spindle cell sarcomas, 3 squamous cell carcinomas.
[806] 2 pulmonary adenomas, 2 spindle cell sarcomas, 4 thymic tumors.
[806a] 1 thymic lymphosarcoma, 4 leukemias, 1 plasmacytoma.
[807] 1 leukemia, 5 mammary carcinomas.
[807a] 2 sarcomas, 1 carcinoma (squamous cell).
[808] 1 thymic lymphosarcoma, 1 leukemia.
[808a] Not reported on in this paper.
[808b] Only early histology discussed.
[809] Anaplastic sarcoma in bones.

Reference	Animal	Strain or type	Sex	Preparation and dose	Site and route	Animals with tumors	Survival	Duration of experiment
568.--3,4-BENZPYRENE--Continued								
Spampinato, 1950a	10 rats	----	----	200 μg. in olive oil, 4 times at monthly intervals	S.C. different sites	0	----	----
Allsopp, 1951	19 mice	Parkes Albino	----	0.1 cc. of a 0.05% in acetone every 3-4 d. alternating with applications of croton oil (0.5% in acetone)	Skin	12 paps.	16 alive at 20 wks.	20 wks.
Benko et al., 1951	7 mice	----	M&F	5 μg. dissolved in oil, twice weekly for 37-73 d. (total dose 50 - 150 μg.)	I.P.	2[810]	----	At least 73 d.
	15 mice	----	M&F	0.5% dissolved in oil for 33 - 343 d.	Skin	1[810]	----	At least 343 d.
Boyland and Sargent, 1951	10 mice	C57	----	0.05 mg. per ml. in 2% aqueous caffeine in 1, 2 or 4 sites	Intradermal	0	----	----
Moretti and Bellini, 1951	600 snails	Helix adspersa Mull.	----	Crystals	Implantation	0[811]	Killed 40th d.	40 d.
	10 newts	Molge Cristata Laur.	----	0.2 ml., saturated solution in lard (5 times)	S.C.	1[812]	Killed at intervals	53 d.
Morton et al., 1915	80 mice[813]	dba	M&F	0.5% in benzene twice weekly for 35 paintings	Skin	38 epi.[814]	----	25 wks.
Rask-Nielsen and Gormsen, 1951	Mice	Street	----	0.5 mg.	S.C.	Tumors[815]	----	----
Salaman and Gwynn, 1951	12 mice	P	M&F	0.3 ml. of a 1.0% soln. in acetone weekly	Skin	Tumors[816]	11 alive at 217 d.	250 d.
	10 mice	P	M&F	0.3 ml. of a 1.0% soln. in acetone, 84 d. interval followed by 2.5% croton oil in mineral oil weekly	Skin	Tumors[817]	8 alive at 217 d.	250 d.
	10 mice	P	M&F	0.3 ml. of 1.0% in acetone once	Skin	0	----	250 d.
	5 mice	T	M	Saturated soln. in mineral oil, 10 drops daily for 60 d. 36 day interval followed by 10 applications of 2.5% croton oil in mineral oil	Skin	Tumors[818]	----	250 d.
	5 mice	T	M	1% in acetone, 10 drops daily for 6 d., 36 day interval followed by 10 applications of 2.5% croton oil in mineral oil.	Skin	Tumors[819]	----	250 d.
Silverstone et al., 1952	100 mice	dba	M	0.2% in acetone, 16 semi-weekly applications, stock diet, and semi-purified diet given after paintings	Skin	73 pap. & epi.	----	53 wks.
Boutwell and Rusch, 1953	Mice	----	----	----	Skin	72% epi.	----	----

[810] No details.
[811] Marked epithelial and connective tissue proliferations.
[812] Epithelioma.
[813] 50% kept in dark, 50% kept in light 12 hours a day.
[814] Also 44 leukemias.
[815] Plasma cell leukemia.
[816] Multiple epithelial skin tumors.
[817] Multiple epithelial skin tumors.
[818] First at 170 days. Epithelial skin tumors.
[819] First at 63 days. Epithelial skin tumors.

Reference	Animal	Strain or type	Sex	Preparation and dose	Site and route	Animals with tumors	Survival	Duration of experiment
568.--3,4-BENZPYRENE--Continued								
Haranghy et al., 1953	1 guinea pig	----	M	1.5 ml. of any oily soln. containing 1.66 mg. per ml., 1 year interval than another inj. (total of 9.96 mg. per animal)	S.C.	1[820]	Killed at 16 mos.	16 mos.
Leone, 1953	85 newts	Triton cristatus Laur.	M&F	20% crystals in albumin, once. In 22 animals α-tocopherol was added	S.C. implant	Tumors[821]	Killed at intervals	52 d.
Tannenbaum and Silverstone, 1953	195 mice	dba	M	0.3% in acetone, 18 applications at twice weekly[822] intervals	Skin	90% (avg.) pap. & epi.	----	51 wks.
Zamurovitch, 1953	30 rats[823]	----	M&F	5 mg. as a 1% soln. in soya oil	S.C. back	22[824]	----	----
569.--CHOLANTHRENE 								
Russell, 1947	11 rabbits	----	----	15 or 20 mg. pellets	Cerebrum	0	5 alive at 4.5 yrs.	4.5 yrs.
	5 rabbits	----	----	12 - 20 mg. pellets	Cerebellum	0	3 alive at 4.5 yrs.	4.5 yrs.
	4 rabbits	----	----	4 mg.	Eye	0	2 alive at 4.5 yrs.	4.5 yrs.
570.--1,2,5,6-DIBENZANTHRACENE 								
Reinhard and Candee, 1936	Mice	Inbred	----	0.02% in food	P.O.	0	----	----
Schabad, 1938	25 guinea pigs	----	M&F	8 - 25 mg. (total dose) in sunflower seed oil, in multiple doses	S.C.	2 tumors[825]	4 alive at 30 mos.	At least 30 mos.
Engelbreth-Holm and Iversen, 1947	Mice	Street	----	0.5% in benzene, 2 times weekly for 24 wks.	Skin	6 epi, 1 pap.	14 alive at 9 mos.	At least 9 mos.
	26 mice	Street	----	0.5 mg. in peanut oil	S.C.	17 sarc.	----	----

[820] Liposarcoma.
[821] Epitheliomas.
[822] 2-8% minerals in diet.
[823] 15 rats hypophysectomized at 60-80 days, injected 40-70 days later.
[824] Unspecified.
[825] One fibrosarcoma at 19 months, 1 malignant lipoma at 22 months.

Reference	Animal	Strain or type	Sex	Preparation and dose	Site and route	Animals with tumors	Survival	Duration of experiment

570.--1, 2, 5, 6-DIBENZANTHRACENE--Continued

Hartmann, 1947	20 mice	----	----	0.03% in olive oil twice weekly for 18 to 24 wks. 40 to 54 paintings[826]	Skin	Tumors[827]	----	----
Jacquemain et al., 1947	Cuttlefish	----	----	Crystals imbedded in vaseline	Under skin of visceral sac	0	----	----
Crabtree, 1948	30 mice	MRC/H hybrids	M&F	0.2% in acetone plus 2% mineral oil twice weekly for 28 wks.	Skin	Tumors[828]	----	At least 28 wks.
Haerem, 1948	10 rats	----	----	0.015 gm. in 0.05 cc. lard, 2 inj. at different sites	S.C.	6 sarc.[829]	----	15 mos.
Lorenz and Stewart, 1948	20 mice	A backcross	M&F	0.16 mg. per cc. mineral oil emulsion instead of drinking water (0.4 mg. per day, total 169 - 172 mg.)	P.O.	Tumors[830]	----	406 d.
Pfeiffer and Allen, 1948	1 monkey	Rhesus	F	0.150 gm. saline suspension (total dose)	Right breast, abdomen	0	----	5.5 mos.
	1 monkey	Rhesus	F	0.133 gm. in sesame oil	Left breast	0	----	12.5 mos.
	2 monkeys	Rhesus	F	0.072 - 0.225 gm. in sesame oil (total dose); also 20-methylcholanthrene	Lower lip, left breast, ears	0	----	11 mos.
	1 monkey	Rhesus	F	5.323 gm. in sesame oil or benzene, also given 20-methylcholanthrene	Left ear, left breast, back, perianal	0	----	4 yrs. 10 mo.
	1 monkey	Rhesus	M	0.090 gm. in paraffin (total dose); also given 20-methylcholanthrene and 3,4-benzpyrene	Left ear, left breast, abdomen, scrotum	0	----	1 yr. 5 mos.
	2 monkeys	Rhesus	M&F	0.028 - 0.030 gm. in sesame oil (total dose); also given 20-methylcholanthrene and 3,4-benzpyrene	Breasts, abdomen, right ear	0	----	9 wks.
	1 monkey	Rhesus	F, castr.	0.452 gm. in sesame oil (total dose), also given 12.60 gm. estrogen	Left breats, right buttock	0	----	2 yrs.
Cook and Schoental, 1949	22 rats	----	M&F	2.5 mg. in 0.5 ml. tricaprylin	S.C.	12[824]	----	9 mos.
Heston and Deringer, 1949a	92 mice	A-hairless backcross	----	0.5 mg. in 0.5 cc. horse serum	I.V.	Tumors[836]	----	5 mos.
Heston and Deringer, 1949b	39 mice	A backcross, hr hr (hairless)	M&F	0.5 mg. in 0.5 cc. horse serum	I.V.	Tumors[832]	----	5 mos.

[824] Unspecified.
[826] Painted on nape then kept at 5° to 9° C for 15 - 60 minutes.
[827] Carcinoma of skin, sarcoma of lungs, tumor of liver and kidney.
[828] 25 with skin tumors, type not stated. Average latent period 24.3 weeks.
[829] 2 with metastases.
[830] 2 squamous cell carcinomas of forestomach, 11 papillomas of forestomach.
[832] 46% with pulmonary adenomas, 0.82 nodules per mouse.
[836] Pulmonary tumors.

Reference	Animal	Strain or type	Sex	Preparation and dose	Site and route	Animals with tumors	Survival	Duration of experiment
570.--1, 2, 5, 6-DIBENZANTHRACENE--Continued								
Heston and Deringer, 1949b	53 mice	A backcross, Hr hr (haired)	M&F	0.5 mg. in 0.5 cc. horse serum	I.V.	Tumors[833]	----	5 mos.
	55 mice	A backcross, PP pink eye	M&F	0.5 mg. in 0.5 cc. horse serum	I.V.	Tumors[834]	----	5 mos.
	37 mice	A backcross, PP-non pink eye	M&F	0.5 mg. in 0.5 cc. horse serum	I.V.	Tumors[835]	----	5 mos.
Neal et al., 1949	30 fowls	----	----	5% pellets with cholesterol	Infra-orbital sinus	0	----	729 d.
Peacock and Peacock, 1949	6 fowls	BL	F	23 mg. pellets	Preening gland[837]	0	----	18 mos.
	2 fowls	WL	M&F	"Few crystals" plus 10 d. embryo epithelium	S.C.	0	----	----
Rauschenbakh, 1949	8 hens	Leghorn	F	15 mg. in paraffin	Bone marrow of femur	0	----	Up to 14 mos.
	80 mice	White	M&F	1% in chicken fat, 0.1 ml. weekly for 10 doses (total of 10 mg.)	S.C.	4 sarc.	----	At least 4 mos.
	10 hens	Leghorn	F	0.3 ml. 1% soln. in chicken fat, once weekly for 12 wks. (each hen received 36 mg.)	S.C.	0	----	Up to 14 mos.
Smith, 1949	5 mice	C	----	0.05 cc. of a 0.02 molar soln. in olive oil, plus suspension of embryo lung.	I.M.	Tumors[838]	----	250 d.
	Mice	C	----	0.05 cc. of a 0.02 molar soln. in olive oil, plus suspension of embryo stomach	I.M.	Tumors[839]	----	178 d.
	Mice	C	----	0.025 cc. of a 0.6 - 1% soln. in olive oil, plus 0.025 cc. embryo skin and 0.075 cc. Locke soln. 25 - 27 implants in several mice.	I.M.	Tumors[840]	----	6 mos.
	6 mice	C	----	0.05 cc. of a 0.5% soln. in tricaprylin, plus 0.05 cc. of embryo skin suspension	I.M.	Tumors[841]	----	175 d.
	Mice	C	M	0.05 cc. of a 0.1 molar soln. in olive oil, plus 0.05 cc. embryo skin suspension	I.M.	Tumors[842]	----	202 d.
Tedeschi, 1949	38 mice	White	M&F	5% in corn oil., 0.03 or 0.3 cc. in each of 5 sites[843]	S.C.	24 sarc.	----	9 mos.
	10 mice	White	M&F	5% in pork fat soln., 0.03 cc. in each of 5 sites.	S.C.	4 sarc.	----	9 mos.

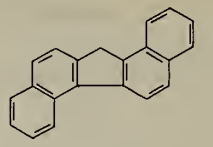
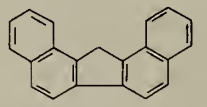
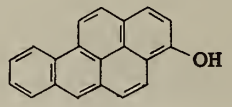
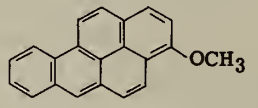
[833] 66% pulmonary adenomas, 2.36 nodules per mouse.
[834] 56% with pulmonary adenomas, 1.81 nodules per mouse.
[835] 59% with pulmonary adenomas, 1.54 nodules per mouse.
[837] Additionally painted with croton oil, 1% in acetone.
[838] 3 adenomas, 2 sarcomas.
[839] 1 adeno-acanthoma
[840] 6 carcinomas, 2 sarcomas.
[841] 5 epitheliomas, 1 sarcoma.
[842] 3 epitheliomas.
[843] Various caloric intakes.

Reference	Animal	Strain or type	Sex	Preparation and dose	Site and route	Animals with tumors	Survival	Duration of experiment
570.--1, 2, 5, 6-DIBENZANTHRACENE--Continued								
Telford, 1949	200 mice	A	M&F	1 mg. in 0.25 cc. olive oil[844]	S.C.	Tumors[845]	50% died in 1 mo.	7 mos.
Williams and Stansfield, 1949	8 rabbits	----	M	200 mg. in a gelatin capsule	Abdominal wall	Tumors[846]	5 alive at 6 mos.	6 mos.
Bauer and Byrne, 1950	13 mice	C and C 57	M&F	0.3 mg. of 20% carcinogen in beeswax pellets, four 20 gauge pellets 3 mm. long	Parotid and submaxillary gland	6[847]	----	28 wks. - 36 wks.
	2 mice	A	F	0.3 mg. of 20% carcinogen in beeswax pellets, four 20 gauge pellets 3 mm. long	Parotid and submaxillary gland	0[848]	----	At least 32 wks.
	2 mice	A, C, C57	----	0.3 mg. of 20% in beeswax pellets, 4 pellets	Parotid and submaxillary gland	Tumors[849]	----	Over 3 mos.
Byrne and Bauer, 1950	Rabbits	----	----	Pellets	Parotid gland	0	All sacrificed at 12 mos.	12 mos.
Cowen, 1950b	24 mice	Stock	M	Saturated soln. in acetone once weekly for 1 yr.	Skin	18 epi., 1 pap.	5 died tumor free	1 yr.
Dobrovolskaia and Rudali, 1950	1000 mice	----	----	50 or 100 μg.	S.C.	85 sarc.	----	----
Rask-Nielson, 1950a	121 mice	Street	M&F	0.02 mg. in 0.01 cc. paraffin	Thymus, mammary region	14[851]	35 alive at 12 mos.	27 or 30 mos.
	80 mice	Street	M&F	0.02 mg. in 0.01 cc. paraffin	Lung	7[852]	14 alive at 12 mos.	27 mos.
Rask-Nielson, 1950b	79 mice	Street	M&F	0.5 mg. in 0.1 cc. paraffin	Lung	27[851a]	6 alive at 12 mos.	27 or 18 mos.
Rask-Nielson, 1950c	96 mice	Street	M&F	0.5 mg. in 0.01 cc. paraffin	Flank, mammary region	29 sarc.[850]	22 alive at 12 mos.	21 mos.
Benko et al., 1951	6 mice	----	M&F	0.5% dissolved in oil for 65 - 190 d.	Skin	0	----	At least 190 d.
	2 mice	----	M&F	5 μg. dissolved in oil, twice weekly for 42 d. (total dose 90 μg.)	I.P.	0	----	At least 42 d.
Ritchie, 1951	Mice	Swiss	F	Saturated soln. in acetone once weekly	Skin	13 pap., & epi.[853]	21 alive at 17 wks.	30 wks.
	Mice	Swiss	F	Saturated soln. in acetone once weekly, injection of saline previous to each painting	Skin	7 pap. & epi.[854]	22 alive at 17 wks.	30 wks.

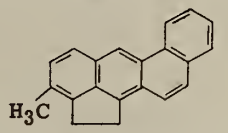
[844] Various diets.
[845] 70.9-100% lung adenomas.
[846] 3 bile duct carcinomas, 1 lung carcinoma, 1 spindle cell sarcoma.
[847] Adeno-acanthomas.
[848] Inflammatory reaction and precancerous changes; no true tumor.
[849] Adeno-acanthoma, adenoma, papillary cystadenoma, undifferentiated carcinoma and giant cell carcinoma of salivary glands. Some metastases of lungs.
[850] Also 1 squamous cell carcinoma.
[851] 3 pulmonary adenomas, 5 thymic lymphosarcomas, 3 mammary carcinomas, 3 leukemias.
[851a] 6 pulmonary adenomas, 14 spindle cell sarcomas, 7 thymic lymphosarcomas.
[852] 1 thymic lymphosarcoma, 4 pulmonary adenomas, 2 leukemias.
[853] 24.7 weeks average latent period.
[854] Average latent period 22.7 weeks.

Reference	Animal	Strain or type	Sex	Preparation and dose	Site and route	Animals with tumors	Survival	Duration of experiment
570. --1,2,5,6,-DIBENZANTHRACENE--Continued								
Ritchie, 1951	Mice	Swiss	F	Saturated soln. in acetone once weekly, injection of adrenalin previous to each painting	Skin	9 pap., & epi.[855]	18 alive at 23 wks.	30 wks.
Steiner and Falk, 1951	50 mice	C57 black	M&F	0.02 mg. in 0.5 cc. tricaprylin	S.C.	28 sarc.	48 alive at 4 mos.	22 mos.
Heston and Deringer, 1952	4 guinea pigs	----	M	20 mg. dispersed in horse serum	I.V.	2[856]	10 alive at 63 mos.	63 mos.
Weil, et al., 1952	75 mice	ABC	M	1.0 mg. in 0.25 ml. lard per inj., 6 inj.	S.C.	34[857]	37 alive	5 mos.
	37 mice	CF1	M	0.025 mg. in 0.0625 ml., 3 inj.	S.C.	22[858]	33 alive	5 mos.
	35 mice	CFW	M	0.025 mg. in 0.0625 ml., 3 inj.	S.C.	17[859]	26 alive	5 mos.
	75 mice	C3H	M	1.0 mg. in 0.25 ml. lard per inj., 6 inj.	S.C.	11[860]	22 alive	5 mos.
	30 mice	RAP	M	0.0002 gm. per ml. acetone, 3 times weekly	Skin	0	----	1 yr.
Deringer and Heston, 1953	53 mice	BL(BaggL)	M&F	0.5 mg. in 0.5 cc. horse serum	I.V.	Tumors[861]	----	4 mos.
	51 mice	A	M&F	0.5 mg. in 0.5 cc. horse serum	I.V.	Tumors[862]	----	4 mos.
	57 mice	(SWR x BL)F_1	M&F	0.5 mg. in 0.5 cc. horse serum	I.V.	Tumors[863]	----	4 mos.
	52 mice	(A x BL)F_1	M&F	0.5 mg. in 0.5 cc. horse serum	I.V.	Tumors[864]	----	4 mos.
	56 mice	(A x SWR)F_1	M&F	0.5 mg. in 0.5 cc. horse serum	I.V.	Tumors[865]	----	4 mos.
	22 mice	Swiss	F	0.5 mg. in 0.5 cc. horse serum	I.V.	Tumors[866]	----	4 mos.
	25 mice	SWR	M	0.5 mg. in 0.5 cc. horse serum	I.V.	Tumors[867]	----	4 mos.
Heston and Schneiderman, 1953	241 mice	A	M&F	0.1 - 0.5 mg. in colloidal dispersion in 0.5 ml. distilled water	I.V.	Tumors[868]	----	6 mos.
Weil et al., (unpub. data)	30 mice	RAP	M	0.0002 gm. per ml. acetone, 3 times weekly	Skin	Tumors[869]	----	1 yr.

[855] Average latent period 25.5 weeks.
[856] 1 sarcoma, 1 pulmonary tumor.
[857] Lung tumors. 15 of 40 surviving lard-injected ABC controls had lung tumors.
[858] Lung tumors. 15 of 29 surviving lard-injected CF_1 controls had lung tumors.
[859] Lung tumors. 12 of 35 surviving lard-injected CFW controls had lung tumors.
[860] Lung tumors. 0 of 29 surviving lard-injected C3H controls had lung tumors.
[861] 100% pulmonary tumors, 21.0 nodules average per mouse.
[862] 100% pulmonary tumors, 66.1 nodules average per mouse.
[863] 100% pulmonary tumors, 34.2 nodules average per mouse.
[864] 100% pulmonary tumors, 51.2 nodules average per mouse.
[865] 100% pulmonary tumors, 79.8 nodules per mouse.
[866] 100% pulmonary tumors, 116.2 nodules per mouse.
[867] 100% pulmonary tumors, 106.8 nodules per mouse.
[868] Pulmonary 8.08-53.37 nodules per mouse average.
[869] Of effective totals 35.8% had papillomas and 10.0% had epitheliomas. Average latent period 380 days.

Reference	Animal	Strain or type	Sex	Preparation and dose	Site and route	Animals with tumors	Survival	Duration of experiment
571.--1,2,5,6-DIBENZOFLUORENE 								
Hill et al., 1951	30 mice	CAF_1	M&F	0.4% in mineral oil twice weekly for 37 wks.	Skin	5 pap.	17 alive at 68 wks.	68 wks.
Riegel et al., 1951	40 mice	CF1	M&F	0.30% in acetone twice weekly for 31 wks.	Skin	14 epi.	33 alive at 15 wks.	31 wks.
572.--1,2,7,8-DIBENZOFLUORENE 								
Riegel et al., 1951	20 mice	CF1	M&F	0.20% in acetone twice weekly for 31 wks.	Skin	0	19 alive at 31 wks.	31 wks.
573.--8-HYDROXY-3,4-BENZPYRENE 								
Cook and Schoental, 1952	Mice	CBA	M&F	0.5% in acetone twice weekly	Skin	6 pap., 5 epi.[870]	----	121 wks.
	16 mice	CBA	M&F	0.2 mg. per 0.2 ml. in tricaprylin, 2 doses at a 5 month interval	S.C.	Tumors[871]	----	117 wks.
574.--8-METHOXY-3,4-BENZPYRENE 								
Cook and Schoental, 1952	17 mice	CBA	M&F	0.5 mg. in 0.1 ml. tricaprylin	S.C.	8 sarc. & epi.[872]	----	95 wks.
	21 mice	CBA	F	Saturated soln. in acetone twice weekly	Skin	20 epi., 1 pap.[873]	----	41 wks.
	18 mice	CBA	M&F	1 mg. in 0.1 ml. tricaprylin	S.C.	18 sarc.[874]	----	27 wks.
	21 mice	CBA	M&F	2.0 mg. in 0.2 ml. tricaprylin	S.C.	16 sarc.[875]	----	67 wks.

[870] Also 7 leucoses, 3 hepatomas, 1 adenocarcinoma and 2 adenomas of lung. 50% of tumors at 113 weeks.
[871] 1 lymphosarcoma, 3 leucoses, 1 lung adenoma.
[872] Also 5 "leucoses", 2 lung adenomas, 1 hepatoma. 50% of tumors at 14 weeks.
[873] Also 2 "leucoses". 50% of tumors at 14 weeks.
[874] 50% at 15 weeks.
[875] 50% of tumors at 22 to 26 weeks.

Reference	Animal	Strain or type	Sex	Preparation and dose	Site and route	Animals with tumors	Survival	Duration of experiment
574.--8-METHOXY-3,4-BENZPYRENE--Continued								
Cook and Schoental, 1952	8 rats	Wistar	M&F	saturated solution in acetone for 39 wks., then 0.5% in benzene twice weekly	Skin	8 epi.[876]	----	87 wks.
	11 rats	Wistar	M	2 mg. per 0.2 ml. of tricaprylin, 2 doses at a 13 wk. interval	S.C.	11 sarc.[877]	----	30 wks.
575.--20-METHYLCHOLANTHRENE 								
Lauber et al., 1939b	Mice	----	----	0 - 29 drops of ether soln. on skin plus 0-4 inj.[878]	Skin and S.C.	[879] ----	----	----
vander Schueren, 1941	47 mice	----	F	0.1 cc. soln. in olive oil, weekly	Vagina	Tumors[880]	9 alive at 288 d.	At least 288 d.
	64 mice	----	M	0.1 cc. of a soln. in olive oil	S.C.	Tumors[881]	----	----
Engelbreth-Holm and Iversen, 1947	27 mice	Street	----	0.5% in benzene, 2 times weekly for 24 wks.	Skin	13 pap., 13 epi, 1 sarc.	All dead by 8 mos.	8 mos.
	38 mice	Street	----	1 mg. in peanut oil	S.C.	23 sarc., 1 epi.	----	----
Hartmann, 1947	30 rats	----	----	0.3% in acetone twice weekly[882]	Skin	0	----	----
Horning, 1947	72 mice	A, C_3H	----	Crystals contained in adult lung implants	S.C.	17 tumors[883]	----	At least 15 weeks.
Ivy and Cooke, 1947	16 rabbits	Kansas Cottontail and domestic	----	15 mg. per d. in capsule with 0.1 cc. benzene in diet[883a]	P.O.	0[883b]	12 alive at 9 mos.	18 mos.
Jaffé, 1947b	53 rats	----	----	2 mg.	S.C.	11 sarc., 6 epi.[884]	----	15 mos.
Jaffé, 1947c	Mice	Albino non-inbred	M&F	0.225 - 0.45 mg. in sesame or olive oil	S.C.	Tumors[885]	----	5 mos.
	Mice	Albino non-inbred	M&F	0.9 mg. in sesame or olive oil	I.P.	Tumors[886]	----	5 mos.

[876] 4 with metastases. 50% of tumors at 49 weeks.
[877] 50% of tumors at 19 weeks.
[878] Other experiments carried out with Vitamins B_1, B_2 and C to see effect of carcinogen.
[879] Skin changes reported.
[880] 10 adenocarcinomas of the mammary gland, 3 sarcomas in the abdominal cavity, and 1 adenocarcinoma-sarcoma. At 270 days 34.2% had tumors.
[881] 57 local sarcomas; also lesions in the liver.
[882] Animals kept after painting for 50-60 minutes at 42-43° C.
[883] Squamous cell carcinoma and adenocarcinoma.
[883a] "Ulcer" induced surgically in posterior wall of stomach.
[883b] Cystic formations in the mucosa of the wild rabbits only.
[884] Also 1 liver sarcoma.
[885] Approximately 40% with pulmonary adenomas.
[886] Approximately 70% with local sarcomas, 76% with pulmonary adenomas, 15% with local tumors, type not stated.

Reference	Animal	Strain or type	Sex	Preparation and dose	Site and route	Animals with tumors	Survival	Duration of experiment
575.--20-METHYLCHOLANTHRENE--Continued								
Jaffé, 1947d	78 mice	Albino	----	0.45 mg. in 0.1 cc. olive oil, one inj.	S.C.	67% sarc.[886a]	----	4 mos.
	164 mice	Albino	----	0.9 mg. in 0.1 cc. olive oil, one inj.	S.C.	80% sarc.[886b]	----	4 mos.
	68 mice	Albino	----	0.225 mg. in 0.1 cc. olive oil, one inj.	S.C.	41% sarc.[886c]	----	4 mos.
McDonald, 1947	30 mice	White stock	M	20 mg. adsorbed on carbon in saline susp.	I.P.	Tumors[887]	----	12 mos.
Barnes et al., 1948	10 mice	C57	M	0.0625 or 0.25 mg. in olive oil	S.C.	Tumors[888]	----	----
	5 mice	C57	F	0.125 mg. in olive oil	S.C.	0	All died	----
	30 mice	C57	M&F	0.0625 - 0.25 mg.[889] in olive oil	S.C.	Tumors[890]	----	----
Burdette, 1948	202 mice	JK x C34 F_1	M&F	1.0 mg. in 0.1 cc. sesame oil	S.C.	164 sarc.[891]	----	----
	164 mice	C3H x JK F_1	M&F	1.0 mg. in 0.1 cc. sesame oil	S.C.	164 sarc.[892]	----	----
Crabtree, 1948	30 mice	MRC/ H hybrids	M&F	0.2% in ether plus 2% mineral oil, twice weekly for 14 wks.	Skin	Tumors[893]	----	At least 14 wks.
Danchakov, 1948	Guinea pigs[894]	----	F	5 mg. every 5 d.	S.C.	0	----	----
	Guinea pig embryo	----	----	0.06 mg. in oil	Allantoid cavity or embryo	0	----	----
Flaks, 1948	10 mice	CBA	M&F	1 mg. in olive oil	S.C.	10 sarc.	----	19 wks.
Howes and deOliveria, 1948	Rats	Wistar	----	Impregnated silk thread	Gastric mucosa	Tumors[895]	----	200 - 590 d.
Jaffé, 1948	205 mice	Albino	----	0.45 or 0.9 mg. once	S.C.	Tumors[896]	----	4 mos.
	44 mice	Albino	----	0.45 or 0.9 mg. once, 0.4% sodium thiosulfate added to diet	S.C.	Tumors[897]	----	4 mos.
Krotkina, 1948	4 monkeys	Rhesus	----	30 - 50 mg.	Femur cavity	1[898]	----	At least 3.5 yrs.
	5 monkeys	Rhesus	F	30 or 50 mg. paraffin pellets	Bone cavity[899]	Tumors[900]	----	At least 4 yrs.
Lansing et al., 1948	Mice	Swiss	----	0.6% in benzene 3 times weekly, 9 times	Skin	0[901]	----	30 d.

[886a] Also 32% lung adenomas.
[886b] Also 45% lung adenomas.
[886c] Also 31% lung adenomas.
[887] Fibrosarcoma in 6 mice; 1 reticulum cell sarcoma.
[888] 3 sarcomas.
[889] Deuteron-bombarded.
[890] 20 sarcomas.
[891] Mean induction time 102.8 days.
[892] Mean induction time 70.1 days.
[893] 29 with skin tumors, type not stated. Average latent period 12.5 weeks.
[894] Pregnant.
[895] Sarcomas, adenomas, adenocarcinomas, papillomas, epitheliomas, all of gastric mucosa.
[896] 64% local tumors.
[897] Approximately 43% local tumors.
[898] Osteogenic sarcoma.
[899] Trephine of major bone, pellet inserted, hole closed.
[900] Osteogenic sarcoma after 3.5 years. No metastases, transplanted to one monkey successfully.
[901] Epidermal hyperplasia. Calcium level studied.

Reference	Animal	Strain or type	Sex	Preparation and dose	Site and route	Animals with tumors	Survival	Duration of experiment
575.--20--METHYLCHOLANTHRENE--Continued								
Lorenz and Stewart, 1948	30 mice	A	M&F	0.4 mg. per cc. mineral oil emulsion instead of drinking water (1.0 mg. per day, total 159 - 178 mg.)	P.O.	Tumors[902]	----	194 d. or 206 d.
	20 mice	C57 brown	M	0.4 mg. per cc. mineral oil emulsion instead of drinking water (1.1 or 1.2 mg. per day, total 153 or 189 mg.)	P.O.	Tumors[903]	----	186 d. or 192 d.
	21 mice	A backcross	M	0.4 mg. per cc. mineral oil emulsion instead of drinking water (0.7 or 1.0 mg. per day, total 178 or 229 mg.)	P.O.	Tumors[904]	----	At least 250 d.
	29 mice	I	M	0.2 mg. per cc. mineral oil emulsion instead of drinking water (0.3 - 0.7 mg. per day, total 50 - 70 mg.)	P.O.	Tumors[905]	----	101 - 168 d.
	8 mice	I	M	0.2 mg. per cc. mineral oil emulsion instead of drinking water (0.3 mg. per day, total 50 mg.)	P.O.	0	----	188 d.
	10 mice	dba	F	0.2 mg. per cc. mineral oil emulsion instead of drinking water (0.5 mg. per day, total 69 mg.)	P.O.	Tumors[906]	----	128 d.
Maisin and Beeckmans, 1948	Mice	----	----	0.25%, 30 or 36 drops[907]	Skin	70[908]	At least 85 alive at 159 d.	159 - 235 d.
Mixer and Kirschbaum, 1948	30 mice	CBA	----	0.25% in benzene 3 times weekly, 18 applications	Skin	Tumors[909]	13 died at 600 d.	750 d.
	34 mice	dba (subline 212)	----	0.25% in benzene 3 times weekly, 18 applications	Skin	Tumors[910]	16 died at 300 d.	600 d.
Pan and Gardner, 1948b	9 mice	CC_1 x BL(G)	M&F	Crystals	Cervix	6[911]	----	At least 140 d.
	6 mice	AB_1 X BL(G)	M&F	Crystals	Cervix	5[912]	----	At least 140 d.
	7 mice	AC_3 x BL(G)	M&F	Crystals	Uterine cervices, horns	5[913]	----	At least 140 d.
	11 mice	AC_3	M&F	Crystals	Uterine cervices, horns	6[914]	----	At least 140 d.
	4 mice	N	F	Crystals	Uterine cervices and horns	4[915]	----	At least 140 d.

[902] Squamous cell carcinomas of forestomach (several with metastases), papillomas of forestomach. First tumor at 90 days.
[903] Squamous cell carcinomas of forestomach, some with metastases. First tumor at 83 days.
[904] 15 squamous cell carcinomas of forestomach (5 with metastases), 2 papillomas of forestomach. 1st tumor at 94 days.
[905] 10 papillomas of forestomach.
[906] 5 papillomas of forestomach.
[907] Varied diet of starch, plus fresh vegetables.
[908] "Skin cancer".
[909] 2 leukemias (84 controls had 9 leukemias).
[910] 11 leukemias (92 controls had 16 leukemias).
[911] 2 carcinomas and 4 sarcomas of the cervix.
[912] 3 carcinomas and 2 sarcomas of the cervix.
[913] 3 carcinomas and 2 sarcomas of the cervix and uterine horn.
[914] 1 carcinoma and 5 sarcomas of the cervix and uterine horn.
[915] 4 sarcomas of the cervix and uterine horn.

Reference	Animal	Strain or type	Sex	Preparation and dose	Site and route	Animals with tumors	Survival	Duration of experiment
575.--20-METHYLCHOLANTHRENE--Continued								
Pan and Gardner, 1948b	15 mice	PBr	M&F	Crystals	Cervix	5[916]	----	At least 140 d.
	13 mice	NHo	F	Crystals	Uterine cervices and horns	2[917]	----	At least 140 d.
	13 mice	BL	M&F	Crystals	Uterine cervices and horns	5[918]	----	At least 140 d.
	20 mice	A	M&F	Crystals	Uterine cervices and horns	16[919]	----	At least 140 d.
	6 mice	BD	M	Crystals	Cervix	1[920]	----	At least 140 d.
Pfeiffer and Allen, 1948	1 monkey	Rhesus	F	0.050 gm. crystals (total dose)	Omentum, rectus sheath	0	----	9 mos.
	1 monkey	Rhesus	F	0.072 gm. in sesame oil	Cervical canal	0	----	2 yrs. 6 mos.
	1 monkey	Rhesus	F	0.096 in sesame oil and in benzene (total dose)	Skin, I.M.	0	----	6 mos.
	1 monkey	Rhesus	F	1.00 gm.; also 3,4-benzpyrene	P.O.	0	----	3 yrs.
	1 monkey	Rhesus	F	1.615 gm. in paraffin, sesame oil or benzene; also 3,4-benzpyrene	Uterus, skin, breast, ears	0	----	10 yrs., 6 mos.
	1 monkey	Rhesus	F, castr.	0.084 gm. in sesame oil and in benzene (total dose)	Lactiferous ducts, breast, skin	0	----	10.5 mos.
	1 monkey	Rhesus	F, castr.	0.100 gm. pellets	Cervix, breasts	0	----	1 yr., 9 mos.
	1 monkey	Rhesus	F, castr.	1.030 gm. in sesame oil, pellets, benzene (total dose); also 3,4-benzpyrene	Breast, ear	0	----	9 yrs.
	1 monkey	Rhesus	M	0.032 gm. crystals and in sesame oil (total dose); also given 3,4-benzpyrene and 1,2,5,6-dibenzanthracene	Nipple, abdomen, ear	0	----	7 wks.
	1 monkey	Rhesus	F	0.042 gm. in sesame oil (total dose); also given 3,4-benzpyrene and 1,2,5,6-dibenzanthracene	Breast, abdomen	0	----	9 wks.
	1 monkey	Rhesus	M	0.351 gm. in sesame oil and pellets (total dose); also given 3,4-benzpyrene and 1,2,5,6-dibenzanthracene	Ear, inguinal region	0	----	1 yr., 5.5 mos.
	1 monkey	Rhesus	F	0.380 gm. in benzene; also given 3,4-benzpyrene and 1,2,5,6-dibenzanthracene	Interscapular skin	0	----	4 yrs., 10 mos.

[916] 2 carcinomas and 3 sarcomas of the cervix.
[917] 2 carcinomas of the cervix and uterine horn.
[918] 3 carcinomas and 3 sarcomas of the cervix and uterine horn.
[919] 16 carcinomas and 5 sarcomas of the cervix and uterine horn.
[920] 1 sarcoma of cervix.

Reference	Animal	Strain or type	Sex	Preparation and dose	Site and route	Animals with tumors	Survival	Duration of experiment
575. --20-METHYLCHOLANTHRENE--Continued								
Pfeiffer and Allen, 1948	1 monkey	Rhesus	F	0.025 gm. in sesame oil (total dose); also given 1,2,5,6-dibenzathracene	Breast	0	----	11 mos.
	1 monkey	Rhesus	F	1.055 gm. sesame oil, benzene, pellets; also given 1,2,5,6-dibenzanthracene	Lactiferous duct, breast, ears, abdomen, thorax, femur	0	----	10 yrs., 9 mos.
	1 monkey	Rhesus	F	0.135 gm. pellets (total dose); also given 127 gm. estrogen	Uterus, cervix	0	----	5 yrs., 1 mo.
	2 monkeys	Rhesus	M&F	0.107 or 0.300 gm. in sesame oil; also given 107 or 188 gm. estrogen	Base of tail	0	----	2 yrs., 1 mo. or 4 yrs.
	1 monkey	Rhesus	F, castr.	0.820 gm. in benzene; also given 2.60 gm. estrogen	Skin, cervical canal	0	----	3 yrs., 3 mos.
	1 monkey	Rhesus	F, castr.	0.025 gm. in horse serum; also given 48 gm. estrogen	I.V.	0	----	1 yr., 6 mos.
	1 monkey	Rhesus	F, castr.	0.100 gm. pellets; also given 120 gm. estrogen	Cervical stump	0	----	2 yrs., 9 mos.
	1 monkey	Rhesus	F, castr.	0.055 gm. crystals; also given 150 gm. estrogen	Omentum	0	----	3 yrs.
Rusch and Kline, 1948	124 mice	C	M&F	0.2% in benzene twice weekly for 19 wks., followed by 0.5% croton oil in benzyl alcohol for 13 wks., 3 times weekly	Skin	90 epi.[921]	----	15 - 18 mos.
	41 mice	C	M&F	0.2% in benzene twice weekly for 31 wks.	Skin	41 epi.[921]	----	15 mos.
	42 mice	C	M&F	0.2% in benzene for 19 weeks, followed by 0.5% croton oil in benzyl alcohol for 13 wks., 3 times weekly	Skin	16 epi.[921]	----	15 mos.
	42 mice	C	M&F	0.2% in benzene for 19 wks.	Skin	14 epi.[921]	----	15 mos.
Schlumberger, 1948	111 frogs	Leopard	M&F	0.4 to 0.7 mg. crystals	Kidney parenchyma	0[922]	30 alive 31 to 120 d.	At least 120 d.
Sylvén and Larson, 1948	22 mice	Swiss	M&F	0.06% in benzene once	Skin	0	----	35 d.
Troitskaya-Andreeva, 1948	50 rabbits[923]	----	F	2 - 15 mg. in paraffin oil	Uterine horn	Tumors[924]	22 alive at 900 d.	At least 900 d.
	50 rabbits	----	F	2.0 - 15.0 mg. in petrolatum jelly	Uterine horn	Tumors[925]	----	Over 1106 d.
Bagshaw and Strong, 1949	3000 mice	pBr subline	M&F	1.0 mg.	S.C.	Tumors[926]	----	----
Baker and Whitaker, 1949	Mice	Swiss	----	0.3% in acetone twice weekly	Skin	Tumors[927]	----	----

[921] Papillomas also but no number given.
[922] 13 renal carcinomas, thought to be spontaneous since 9 of 68 normal controls had these tumors.
[923] Laparotomized.
[924] 1 proliferating adenoma penetrating to serosa 1005 days after 5 mg., 1 sarcoma with metastases to peritoneum and lungs, 1083 days after 10 mg., 1 sarcoma with metastases to lung, 1106 days after 5 mg.
[925] 1 adenoma at 1005 days, 2 sarcomas at 1106 and 1083 days.
[926] 78 epidermoid carcinomas, spindle cell neoplasms, or mixed tumors of the stomach. Average latent period 454 days.
[927] Epitheliomas.

Reference	Animal	Strain or type	Sex	Preparation and dose	Site and route	Animals with tumors	Survival	Duration of experiment

575.--20-METHYLCHOLANTHRENE--Continued

Bielschowsky and Bullough, 1949	30 mice	Kreyberg's white label	F	0.1 ml. of 0.6% in acetone, 4 applications at 15 minute intervals	Skin	3 epi., 4 pap.	----	20 wks.
Boutwell et al., 1949a	96 mice	Rockland	F	0.3% in benzene twice weekly, 38 applications[928]	Skin	9 pap., 61 epi.	85 alive at 116 d.	At least 214 d.
Boutwell et al., 1949b	192 mice	----	F	0.3% in benzene twice weekly, 30 applications ([929])	Skin	Average 82% epi.	180 alive at 105 d.	164 d.
Danchakov and Nicod, 1949	Guinea pigs	----	F	5 mg. every 5 d.	S.C.	0	----	----
	Guinea pig embryo	----	----	0.06 mg. in oil	Allantoid cavity or embryo	0	----	----
Dmochowski and Orr, 1949	22 mice	C3H	M	0.5% in sweet almond oil, 16 drops at 2 wk. intervals	Skin	8[930]	Average age of death 253 d.	At least 253 d.
	41 mice	C57 black	M&F	0.5% in sweet almond oil, 16 drops every 2 wks.	Skin	Tumors[931]	----	296 - 349 d.
Firminger and Stewart, 1949	200 mice	C57 brown A backcross	M&F	0.01 cc. of aqueous methocel suspension containing 30 mg. per cc.	I.P. Forestomach	Tumors[932]	Killed 4 per week	12 mos.
George, et al., 1949	250 mice	----	----	0.25 mg. in sesame oil once[933]	S.C.	Tumors[934]	All died at 9 wks.	9 wks.
	425 mice	----	----	0.25 mg. in sesame oil once[935]	S.C.	Tumors[936]	----	----
Horning, 1949	Mice	A	M	Crystals with strips of prostatic tissue	S.C.	Tumors[937]	----	----
Hughes, 1949	23 mice	Strong A	----	Crystals plus bladder epithelium from a similar mouse	S.C.	Tumors[938]	----	----
	32 mice	C57	----	Crystals plus bladder epithelium from a similar mouse	S.C.	Tumors[939]	----	----
	65 mice	C3H	----	Crystals plus bladder epithelium from a similar mouse	S.C.	Tumors[940]	----	----
Hughes and Clymer, 1949	30 mice	C3H	----	Crystals plus bladder epithelium from a similar mouse	S.C.	Tumors[941]	6 died in 2 mos.	At least 2 mos.
	Mice	Stock	----	Crystals plus bladder epithelium (mouse)	S.C.	Tumors[942]	----	----

[928] Diet of various percentages of fat, carbohydrate free, 9.5 calories mouse per day.
[929] Various diets given.
[930] Skin tumors.
[931] Skin tumors, 3 mammary tumors, 1 spindle cell sarcoma.
[932] Mostly squamous cell carcinoma of forestomach and some sarcomas.
[933] Mice maintained at 3500 meters in the Swiss Alps to study effect of cosmic radiation.
[934] Number and types not stated.
[935] In lead chambers to screen cosmic radiations, various thicknesses from 1 to 10 cm.
[936] Local tumors, numbers and types not stated. Latent period 11 to 18 week average
[937] Adenocarcinoma and squamous cell carcinomas induced.
[938] 2 bladder carcinomas.
[939] 1 transplantable bladder carcinoma.
[940] 11 transplantable bladder carcinomas.
[941] 4 squamous cell carcinomas in 2.5 - 3.5 months, 3 sarcomas in 4 - 6 months.
[942] 1 squamous cell carcinoma.

Reference	Animal	Strain or type	Sex	Preparation and dose	Site and route	Animals with tumors	Survival	Duration of experiment
575.--20-METHYLCHOLANTHRENE--Continued								
Kirschbaum et al., 1949	231 mice	CBA	----	0.25% in benzene 18 times	Skin	22[943]	----	700 d.
	22 mice	NHDxD backcross	F	0.25% in benzene 3 times weekly, 18 to 50 times	Skin	2[944]	----	26 mos.
	15 mice	NHD x NHD F_2	F	0.25% soln. in benzene 3 times weekly, 18 to 50 times	Skin	3[944]	----	30 mos.
	18 mice	NH x DF_1	F	0.25% soln. in benzene 3 times weekly, 18 to 50 times	Skin	3[944]	----	34 mos.
	108 mice	Bagg Albino	----	0.25% in benzene 18 times	Skin	1[945]	----	700 d.
Ma, 1949	Mice	Swiss	F	0.6% in benzene 3 times weekly	Skin	0[946]	----	60 d.
Martinova and Shabad, 1949	182 mice	C57 black	F	1 mg. in 0.1 - 0.2 cc. refined sunflower seed oil, single dose	S.C.	Tumors[947]	122 alive at time of first tumor	At least 184 d.
Marzullio and Russo, 1949	6 pigeons	----	----	0.5% in oil	I.M.	6 sarc.	----	----
Pan and Gardner, 1949	98 mice	Inbred and hybrid	F	Crystals	Uterine horns and cervix	31[948]	----	Over 3 mos.
Peacock and Peacock, 1949	20 fowls	WL	M&F	5 to 30 mg. pellets plus 10 day embryo epithelium	S.C.	0	3 killed at 12 mos.	----
	6 fowls	BL	F	15 to 30 mg. pellets	Preening[949] gland	0	----	18 mos.
Plaut and Sobel, 1949	32 mice	C57 black	----	0.3% in lanolin 3 times weekly for 14 wks.	Skin	0	----	57 wks.
	35 mice	C57 black	----	0.3% in benzene 3 times weekly for 14 wks.	Skin	35[950]	----	35 wks.
	30 mice	C57 black	----	0.3% in lard 3 times weekly for 14 wks.	Skin	26[950]	----	57 wks.
	35 mice	C57 black	----	0.3% in sebum 3 times weekly for 14 wks. (Human sebum from sebaceous cyst)	Skin	28[950]	----	57 wks.
Prina and Tentoni, 1949	5 rats	----	----	Crystals	Left femur	Tumors[951]	----	5 mos.
Pullinger, 1949	Mice	RIIIX	F	0.2% in acetone	Skin	Tumors[952]	----	----
Roberts and Frankel, 1949a	38 mice	Swiss	F	0.6 gm. in 88 gm. benzene, 3 times weekly, 24 applications	Skin	----	----	9 wks.
Rusch and Kline, 1949	Mice	----	----	----, plus croton oil treatment in some	Skin	Pap.	----	Over 7 mos.

[943] Lymphomas.
[944] Mammary tumors.
[945] Lymphoma.
[946] A histological study of the dermis.
[947] Sarcomas in 77 per 122 mice (63.1%) mean time 109 days, carcinomas in 4 per 122 mice (3.3%) mean time 131 days, carcinosarcoma in one per 122 mice (0.8%) at 66 days.
[948] 28 epitheliomas and 3 adenocarcinomas in grafts.
[949] Additionally painted with croton oil, 1% in acetone.
[950] Skin, type not specified.
[951] Sarcomas from the connective tissues.
[952] Of the skin.

Reference	Animal	Strain or type	Sex	Preparation and dose	Site and route	Animals with tumors	Survival	Duration of experiment
575. --20-METHYLCHOLANTHRENE--Continued								
Russell and Loquvam, 1949	31 chickens	White leghorn	----	Pellets of 30% in cholesterol	Right cerebral hemisphere	0	10 alive at 3 yrs.	----
Russell and Ortega, 1949	98 guinea pigs	----	M&F	30 mg. in sesame oil[952a]	S.C.	39[953]	----	242 - at least 393 d.
Schinz and Steinman, 1949	5 rabbits	----	F	1% in sesame oil, 0.25 - 0.50 ml.	Foetus after laparotomy	Tumors[954]	----	6 yrs.
Setälä, 1949a	10 mice	Mixed	M&F	Weekly 0.36% in acetone, 3 times	Skin	90% pap. & epi.	----	16 wks.
	10 mice	Mixed	M&F	2 mg. in 0.5 cc. Carbowax	S.C.	Sarc.	----	At least 14 wks.
	10 mice	Mixed	M&F	1.0% in Carbowax 3 times weekly	Skin	100% pap. & epi.	----	120 d.
	10 mice	Mixed	M&F	0.3% in dioxane 3 times weekly	Skin	100% pap. & epi.	----	70 d.
Shay et al., 1949a	55 rats[955]	Wistar	M&F	2 mg. in 0.5 cc. olive oil 6 days per wk., 6 - 14 mos.	P.O.[23]	0	----	At least 6-14 mos.
	28 rats	Wistar	F	2 mg. in 0.5 cc. olive oil 6 d. per wk., 6 - 14 mos.	P.O.[23]	15[956]	----	----
Shay et al., 1949b	57 rats	Wistar	M&F	2 mg. in 0.5 cc. olive oil daily 6 d. per wk.[957]	P.O.[23]	29[958]	----	266 - 418 d.
	37 rats	Wistar	M&F, castr.	2 mg. in 0.5 cc. olive oil daily 6 d. per wk.[957]	P.O.[23]	18[959]	----	At least 1 yr.
Shimkin and McClelland, 1949	90 mice	A	M	1 mg. as 2 injections in 0.5 cc. aqueous cholesterol colloid	I.V.	81[960]	81 alive at 8 wks.	8 - 18 wks.
	360 mice	A	M	0.0625 - 0.5 mg. in 0.5 cc. aqueous cholesterol colloid	I.V.	274[960]	346 alive at 8 wks.	8 - 18 wks.
Smith, 1949	Mice	C	----	0.025 cc. of a 1% soln. in olive oil, plus 0.025 cc. embryo skin plus 0.075 cc. Locke soln. 33 implants in several mice	I.M.	Tumors[961]	----	6 mos.
	6 mice	C	----	0.05 cc. of 0.5% soln. in tricaprylin, plus 0.05 cc. embryo skin suspension	I.M.	Tumors[962]	----	73 d.
Smith and Rous, 1949	Mice[963]	C	----	In olive oil	S.C.	Tumors[964]	----	----
Stewart et al., 1949a	Rats	Osborne-mendel, Marshall 520, AXC	----	0.6 mg. in aqueous soln. with methyl cellulose	Glandular stomach	Tumors[966]	96 autopsied	----

[23] Stomach tube.
[952a] Diet varied.
[953] Fibrosarcomas, liposarcomas, osteogenic sarcomas.
[954] 1 lung carcinoma, 1 adenoma of the uterus.
[955] 12 females and 24 males castrated.
[956] Mammary adenocarcinoma, first in 143 days.
[957] Various diets.
[958] Mammary adenocarcinomas, squamous cell carcinoma.
[959] Mammary adenocarcinoma.
[960] Pulmonary adenomas. 7 or 60 controls had pulmonary adenomas.
[961] 22 carcinomas, 4 carcinoma and sarcoma, 4 sarcomas.
[962] 6 epitheliomas.
[963] Embryo implanted in adults. Skin, lung and stomach fragments.
[964] Pulmonary adenomas in 3 weeks.
[966] Adeno-acanthoma, adenocarcinoma, sarcoma of stomach.

Reference	Animal	Strain or type	Sex	Preparation and dose	Site and route	Animals with tumors	Survival	Duration of experiment

575. --20-METHYLCHOLANTHRENE--Continued

Stewart et al., 1949b	Mice	C, C57 black, C3H, C3Hb, dba	M&F	0.01 cc. of a suspension containing 0.3 mg.	Pyloric stomach	Tumors[965]	250 autopsied	----
Tannenbaum and Silverstone, 1949a	243 mice	dba	M	0.3% in acetone, 5 applications at 5 d. intervals, after 14 wks. 7 more applications at 5 d. intervals[969]	Skin	182 pap. & epi.[970]	21 alive at 46 wks.	46 wks.
Tannenbaum and Silverstone, 1949c	300 mice	C3H	M	0.3% in acetone, 7 applications over a period of 30 d.[967]	Skin	Tumors[968]	195 alive at 51 wks.	51 wks.
Andervont and Dunn, 1950	118 mice	dba	F	0.5 or 0.25% in benzene twice weekly, 14 - 37 applications	Skin	98[971]	----	----
Bagshaw and Strong, 1950	2500 mice	pBr subline	M&F	1 mg. in 0.1 cc. sesame oil	S.C.	Tumors[972]	8% alive	At least 700 d.
Bauer and Byrne, 1950	9 mice	C57 black	M&F	0.3 mg. of 20% carcinogen in beeswax pellets, four 20 gauge pellets 3 mm. long	Parotid, submaxillary gland	5[973]	13 alive to 17 wks.	At least 17 wks.
	61 mice	C	M&F	0.3 mg. of 20% carcinogen in beeswax pellets, four 20 gauge pellets 3 mm. long	Parotid, submaxillary gland	Tumors[974]	----	18 wks.
	2 mice	A	F	0.3 mg. of 20% carcinogen in beeswax pellets, four 20 gauge pellets 3 mm. long	Parotid, submaxillary gland	1[973]	----	8 wks.
	50 mice	AK	M&F	0.3 mg. of 20% carcinogen in beeswax pellets, four 20 gauge pellets 3 mm. long	Parotid, submaxillary gland	7[973]	----	24 wks.
	6 rabbits	----	----	1.2 mg. of a 20% soln. in beeswax, pellets (2 - 3 pellets of 1.2 mg. each)	Parotid duct	0	Killed at intervals	1.5 yrs.
	6 rabbits	----	----	Pellets, 20% in beeswax	Parotid gland	0	Killed at intervals	1.5 yrs.
	2 mice	A, C, C57, AK	----	0.3 mg. of 20% in beeswax pellets, 4 pellets	Parotid, submaxillary gland	Tumors[975]	----	Over 6 mos.
Bernelli-Zazzera, 1950	24 mice	----	----	3% in benzene, 3 times a week (total of 47 paintings)	Skin	13[976]	19 alive	4 mos.
Billingham et al., 1950	Mice	----	----	0.30% in acetone one weekly for 12 weeks[977]	Skin	12[978]	----	At least 12 wks.
	Mice	----	----	0.30% in acetone once weekly for 12 wks[979]	Skin	13[980]	----	At least 12 wks.

[965] 24 sarcomas, 8 adenocarcinomas, 2 adeno-acanthoma of glandular stomach, 37 epithelial-sarcomas combined lesion; 2 epitheliomas of forestomach; and 90 precancers of glandular stomach.
[967] Varied diet.
[968] Skin tumors.
[969] Various percentage of casein in diet.
[970] Average latent period at least 33.3 weeks.
[971] 53 mammary tumors, 17 leukemias, 51 skin tumors.
[972] Only mice with gastric neoplasma considered in this paper; 84 total malignant gastric tumors, 45 epitheliomas, 19 spindle cell sarcomas, 17 mixed tumors. 1 adenocarcinoma, 2 undiagnosed, 31 papillomas, 3 adenomas. Pulmonary adenomas in 37 mice, 5 local sarcomas.
[973] Adeno-acanthomas.
[974] 22 adeno-acanthomas, 5 papillary cystadenocarcinomas, 3 myoephithelial carcinomas, 3 undifferentiated carcinomas.
[975] Adeno-acanthoma, adenoma, papillary cystadenoma, undifferentiated carcinoma, and giant cell carcinoma of salivary glands. Some metastases to the lungs.
[976] 6 carcinomas.
[977] Epidermis removed from treated area and grafted with tail skin.
[978] All on treated area, type not stated. Average latent period 78 days after grafting.
[979] Epithelial grafts from treated area transplanted to another site.
[980] All on treated area, type not stated. Average latent period 93 days after grafting.

Reference	Animal	Strain or type	Sex	Preparation and dose	Site and route	Animals with tumors	Survival	Duration of experiment
575.--20-METHYLCHOLANTHRENE--Continued								
Billingham et al., 1950	Mice	----	----	0.30% in acetone once weekly for 12 weeks[981]	Skin	5[982]	----	At least 12 wks.
	Mice	----	----	0.30% in acetone once weekly for 12 weeks[981]	Skin	4[983]	----	At least 12 wks.
Bonser and Robson, 1950	65 mice[984]	White	F	0.1 mg. crystalline	Uterine horn through abdomen	16[985]	----	18.5 mos.
	13 mice[986]	CBA	F	0.1 mg. crystalline	Uterine horn through abdomen	10[987]	----	17.5 mos.
Bonte, 1950	18 frogs	Rana Temporarial	----	2% in olive oil for 7 wks.	Skin	0	----	At least 7 wks.
Breedis, 1950	44 salamander	Triturus viridescens	----	In olive oil, 1 injection	S.C.	0[988]	----	At least 200 d.
Byrne and Bauer, 1950	Rabbits	----	----	Pellets	Parotid gland	0	Sacrificed at various intervals	12 mos.
Denton et al., 1950	14 rabbits[989]	----	----	15 mg. per 0.1 cc. benzene in capsules daily for 6 d. per wk., 1 yr., 18 mos.	P.O.	1 pap.[990]	9 killed at 1 yr.	18 mos.
	7 rabbits	----	----	15 mg. in benzene and shale oil daily for 2 mos., followed by 5 cc. of an emulsion containing 800 mg. methycholanthrene in 80 cc. shale oil with cetyl alcohol, cholesterol, and monoglyceryl stearate, Aerosol OT and distilled water (868 cc.) up to 9 mos.	P.O.	0	----	9 mos.
Desforges et al., 1950	14 guinea pigs	----	M&F	5% by weight pellets with cholesterol, 20 - 40 mg. containing 1 - 2 mg. ml., 2 pellets	Gall bladder	0[991]	Killed at various times	41 wks.
Friedewall and Rous, 1950	3 rabbits	Agouti	----	0.3% in ethyl ether containing 2% light mineral oil, twice weekly for 215 to 250 d.	Skin	3 pap., 2 epi.	----	1957 d.
	2 rabbits	Agouti	----	0.3% in benzene twice weekly for 215 to 250 d.	Skin	2 pap., 2 epi.	----	2552 d.
Horning, 1950	16 mice	A	M&F	Crystals plus graft of lung tissue	S.C.	Tumors[992]	----	Over 12 wks.
	35 mice	A	M&F	Crystals plus graft of lung tissue	S.C.	0	----	Over 12 wks.

[981] Thiersch grafts from treated area transplanted to other sites.
[982] All on treated area, type not stated. Average latent period 67 days.
[983] 3 on treated area, type not stated. Average latent period 92 days after grafting.
[984] 26 castrates.
[985] 7 sarcomas, 10 adenocarcinomas.
[986] 4 castrates.
[987] 6 sarcomas, 3 adenocarcinomas, 1 squamous carcinoma of uterus.
[988] 1 accessory limb.
[989] With excisional gastric ulcers.
[990] At the edge of the ulcer.
[991] A typical epithelial proliferation bordering on carcinoma.
[992] 18 bronchogenic carcinomas in the grafts.

Reference	Animal	Strain or type	Sex	Preparation and dose	Site and route	Animals with tumors	Survival	Duration of experiment
575. --20-METHYLCHOLANTHRENE--Continued								
Law and Miller, 1950	26 mice[993]	dba subline 212	M&F	0.2% in ethyl ether, 3 times weekly	Skin	Tumors[994]	Average death 9.8 mos.	16 mos.
	48 mice[995]	dba subline 212	M&F	0.2% in ethyl ether, 3 times weekly	Skin	Tumors[996]	Average death 10.2 mos.	16 mos.
	33 mice[997]	dba subline 212	M&F	0.2% in ethyl ether, 3 times weekly	Skin	Tumors[998]	Average death 9.4 mos.	16 mos.
	50 mice[999]	dba subline 212	M&F	0.2% in ethyl ether, 3 times weekly	Skin	Tumors[1000]	Average death 8.1 mos.	16 mos.
	59 mice	dba subline 212	M&F	0.2% in ethyl ether, 3 times weekly	Skin	Tumors[1]	Average death 9.5 mos.	16 mos.
Morgan, 1950	105 mice	Y (brown), Y (yellow)	M&F	0.5 mg. in 0.5 cc. horse serum	I.V.	42[2]	Autopsied at 7 mos.	7 mos.
Nettleship and Smith, 1950	20 hamsters	----	----	1.0 mg. in olive oil and carbon black once	S.C.	19 sarc.	----	60 to 80 d.
	6 hamsters	----	----	0.5 mg. in 0.25 ml. of tricaprylin	S.C.	6 sarc.	----	----
Oberling and Guérin, M., 1950	50 chickens	----	F	1 injection of 0.5 ml. in oil (2%) (= 10 mg.)	S.C.	1	----	At least 33.5 mos.
O'Flynn, 1950	Mice[3]	----	F	0.001 gm. in peanut oil	S.C.	Tumors[4]	----	----
	Mice	----	M	0.002 gm. in 0.1 ml. of peanut oil, plus bull testis extract containing hyaluronidose	S.C.	Tumors[5]	----	----
Rask-Nielson, 1950a	48 mice	Street	M&F	0.02 mg. in 0.1 cc. paraffin	Mammary region	7[7]	11 alive at 12 mos.	27 mos.
	73 mice	Street	M&F	0.02 mg. in 0.01 cc. paraffin	Lung	3[8]	17 alive at 12 mos.	27 mos.
Rask-Nielson, 1950b	77 mice	Street	M&F	0.5 mg. in 0.01 cc. paraffin	Lung	31[8a]	2 alive at 12 mos.	18 mos.
Rask-Nielson, 1950c	57 mice	Street	M&F	0.5 mg. in 0.01 cc. paraffin	Flank	Tumors[6]	4 alive at 12 mos.	30 mos.
	60 mice	Street	M&F	0.5 mg. in 0.01 cc. paraffin	Mammary region	27[7a]	5 alive at 12 mos.	15 mos.
Shubik, 1950b	28 mice	CF-1	M&F	0.15% in acetone twice weekly for 30 wks.	Skin	5 pap., 17 epi.	28 alive at time of first tumor	40 wks.

[993] Autologous transplants of thymus.
[994] 18 leukemias; other tumors not recorded.
[995] Homologous thymus grafts.
[996] 31 leukemias; other tumors not recorded.
[997] Splenectomized.
[998] 19 with leukemia; other tumors not recorded.
[999] Thymectomized.
[1000] 19 epitheliomas, 4 mammary carcinomas, 11 leukemias.
[1] 17 epitheliomas, 8 mammary and 43 leukemias.
[2] Pulmonary adenomas.
[3] Pregnant.
[4] Some were adenocarcinomata; transplanted into dorsal subcutaneous tissue of 30 male mice.
[5] Earliest growth appeared 3 weeks after the injection. Transplanted into 7 male mice over the butt of the tail, only one grew: mixed cell sarcoma.
[6] 17 sarcomas, 3 squamous cell carcinomas.
[7] 4 spindle cell sarcomas, 1 pulmonary adenoma, 2 leukemias.
[7a] 17 sarcomas, 10 squamous cell carcinomas.
[8] 1 pulmonary adenoma, 2 leukemias.
[8a] 2 pulmonary adenomas, 19 spindle cell sarcomas, 10 thymic lymphosarcomas.

Reference	Animal	Strain or type	Sex	Preparation and dose	Site and route	Animals with tumors	Survival	Duration of experiment

575.--20-METHYLCHOLANTHRENE--Continued

Shubik, 1950b	30 mice	CF-1	M&F	0.3% in acetone once, followed by 5% croton oil in mineral oil twice weekly for 40 wks.	Skin	2 epi., 17 pap.	30 alive at time of first tumor	41 wks.
Silberberg and Silberberg, 1950	Mice	Swiss	----	0.3% in benzene	Skin grafts (subcutaneously)	0[10]	----	12 mos.
Sissons, 1950b	Rats	P.V.G.	----	50% in cholesterol, 2.3 mg. pellets	S.C.	Tumors[11]	----	Over 9 mos.
	Rats	P.V.G.	----	50% in cholesterol, 2.3 mg. pellets	Bone cavity	Tumors[12]	----	Over 17 mos.
	Mice	C57	----	2.0 mg. pellet of 1% in wax	Bone cavity	0	----	----
	Mice	C57	----	10% in wax, 0.4 or 3.5 mg. pellets	Bone cavity	Tumors[13]	----	----
	Mice	C57	----	10% in wax, 3.5 mg. pellets	Bone cavity	Tumors[13a]	----	----
	Mice	C57	----	50% in cholesterol, 2.0 mg. pellets	Bone cavity	Tumors[14]	----	----
Smith, 1950	Mice	C	M	1% in olive oil, saturated with Scharlach Red (0.025 cc.), with fetal lung mince	S.C.	Tumors[15]	----	208 d.
	Mice	A	----	1% in olive oil, saturated with Scharlach Red, with embryo lung mince	S.C.	Tumors[16]	----	At least 125 d.
Spampinato, 1950b	20 mice	Albino	----	0.3% in xylol every 3rd d.	Skin	Tumors[17]	----	----
Stern, 1950b	22 mice	C57 black	M	0.3 cc. of a 0.2% in olive oil (0.6 mg.)	S.C.	Tumors[18]	----	27 wks.
Steward and Hare, 1950	Rats	----	----	Methocel suspension	I.M.	0[19]	----	20 wks.
Strong, 1950a	996 mice	Prunt, 2 Prunt (sublines of NH)	M&F	1 mg. in 0.1 cc. sesame oil	S.C.	649 sarc.	----	----
Strong, 1950b	544 mice	pBr subline	F	1 mg. in 0.1 cc. sesame oil	S.C.	Tumors[20]	----	Over 100 d.
Strong, 1950c	788 mice	Prunt, 2 Prunt (NHO)	M&F	1 mg. in 0.5 cc. sesame oil	S.C.	100% sarc.	----	----
Taylor et al., 1950	3 dogs	----	F	1% in benzene once weekly painting	Cervix	0[21]	----	190 wks.
	4 dogs	----	F	100 mg. in 1 cc. paraffin	Cervix uteri	0	2 died at 47 wks.	67 wks.
	5 rabbits	----	F	30 mg. in 0.2 cc. paraffin	Squamo-columnar junction of vagina	0	3 died at 68 wks.	73 wks.
	4 rabbits	----	F	1% in benzene once weekly	Vagina	0	----	76 wks.

[10] Keratinized cysts found.
[11] 100% sarcomas, average latent period 9 months.
[12] 9% sarcomas, anaplastic in bone; average latent period 17 months.
[13] 5% with anaplastic spindle or round cell sarcomas in the bone.
[13a] 85% with anaplastic spindle or round cell sarcomas in the bone.
[14] 100% with anaplastic spindle or round cell sarcoma in bone.
[15] Squamous cell carcinoma, transitional cell carcinoma, anaplastic carcinoma, adenomas, sarcoma--in grafts.
[16] Adenomas and carcinomas--in grafts.
[17] 22%.
[18] 90% sarcomas.
[19] This summary does not include data on pathology.
[20] Fibrosarcomas.
[21] Leukoplakia in one.

Reference	Animal	Strain or type	Sex	Preparation and dose	Site and route	Animals with tumors	Survival	Duration of experiment
575. --20-METHYLCHOLANTHRENE--Continued								
van der Schueren and Debie, 1950	25 mice	----	----	0.5 or 0.2% in olive oil, 1 or 6 injections of 0.1 cc.	Pleural cavity	11 sarc.[22]	----	----
	35 mice	----	----	In olive oil weekly	Rectal mucosa	Tumors[23]	20 alive at time of first tumor	----
	52 mice	----	----	In olive oil	S.C.	38 sarc.	39 alive at time of first tumor	----
	39 rats	----	F	0.2 cc. of 0.2% olive oil soln. weekly, 64 or 98 injections	Vaginal mucosa	Tumors[24]	25 alive at 338 d.	338 - 625 d.
	40 rats	----	----	0.5 or 0.2 cc. of a 0.2% olive oil soln. weekly, 2 or 10 injections	S.C.	14 sarc.	27 alive at 120 d.	120 or 150 d.
	107 mice	----	F	0.2% in olive oil, 0.2 cc. weekly	Vaginal wall	Tumors[24a]	77 alive at 146 d.	At least 146 d.
Billingham et al., 1951	128 mice	Mixed stock	M&F	0.3% in acetone	Skin graft	36 epi, 25 pap.	----	400 d.
Breedis, 1951	34 salamander	Triturus viridescens	----	1 - 5 mg. crystals in olive oil	Forelimb	2 sarc.[25]	----	At least 18 mos.
Cambel and Ray, 1951	Mice	Swiss	----	0.6% in benzene, 3 application in 1 wk.	Skin	Tumors[26]	----	"a long time"
Deringer, 1951	51 mice	hr/hr (haired)	M&F	0.5 mg. in 0.5 cc. horse serum	I.V.	11[27]	----	12 mos.
	46 mice	hr/hr (haired)	M&F	0.2% in ether weekly for 20 wks.	Skin	20 pap., 29 epi.[28]	----	6.4 mos. or 7.6 mos.
	44 mice	hr/hr (hairless)	M&F	0.2% in ether weekly for 20 wks.	Skin	29 pap., 41 epi.[29]	----	At least 5.8 mos.
	34 mice	hr/hr (hairless)	M&F	0.5 mg. in 0.5 cc. horse serum	I.V.	Tumors[30]	----	12 mos.
Firminger and Stewart, 1951	220 mice	C57 brown and A backcross hybrids	M&F	0.6 mg. in 0.02 cc. aqueous suspension (Aerosol O.T., Methocel and ethyl alcohol)	Glandular stomach	Tumors[31]	Killed at various intervals	77 wks.
Hickey et al., 1951	40 mice	Swiss	----	0.1 mg. in lard with embryonic skin into one side, without embryonic skin on the other	S.C.	Tumors[33]	----	9 mos.

[22] In the thoracic cavity.
[23] 2 local leiomyosarcomas, 1 lymphosarcoma and 1 epithelioma of skin.
[24] 1 polyp of Fallopian tube.
[24a] 25 mammary adenocarcinomas, 4 sarcomas, 1 epithelioma of skin. No tumors of vaginal or uterine origin.
[25] Spindle cell.
[26] Papilloma, epitheliomas, pulmonary adenoma and forestomach carcinoma.
[27] 2 skin papillomas, 8 pulmonary tumors, 1 papilloma.
[28] 13 fibrosarcomas, 1 pulmonary tumor, 1 carcinosarcoma.
[29] Pulmonary tumor in addition.
[30] 5 pulmonary tumors, 2 skin papillomas, 1 hemangio-endothelioma.
[31] 83 squamous cell carcinomas, 4 sarcomas, 12 carcinoma and sarcomas, and many with "precancerous" lesions of stomach.
[33] Mostly mesodermal.

Reference	Animal	Strain or type	Sex	Preparation and dose	Site and route	Animals with tumors	Survival	Duration of experiment
575. --20-METHYLCHOLANTHRENE--Continued								
Hitchcock, 1951a	54 mice	C3H, A, DB2	M&F	0.25 mg. per gm. in the diet, 10 mg. daily for 317 d.	P.O.	Tumors[34]	51 alive at 200 d.	At least 317 d.
	70 mice	C3H, A	M&F	0.25 mg. per gm. in the diet, 10 mg. daily for 215 d.; also bile salts	P.O.	Tumors[35]	42 alive at 200 d.	At least 200 d.
Hitchcock, 1951b	27 mice	C3H, A, I	----	0.2 cc. emulsion 25 times, alternating with eugenol (no concentration given)	P.O.[36]	Tumors[37]	----	205 d. average
	31 mice	C3H, A, I	----	0.2 cc. emulsion 25 times, alternating with eugenol. Carcinogen heated. (no concentration given)	P.O.[36]	Tumors[38]	----	169 d. average
	15 mice	C3H, A, I	----	15 injections of 25% eugenol in olive oil	P.O.[36]	0	----	250 d. average
Hollander and Strong, 1951	100 mice	3 CAMG, subline of Br-S	----	1 mg.	S.C.	Sarc.[39]	----	10 mos.
Howes and de Oliveira, 1951	75 rats	Wistar	----	Impregnated silk thread	Serosa of the stomach	0	----	----
Jull, 1951	6 mice	Kreyberg albino	F	30% in paraffin wax pellet	Bladder	1[40]	----	34 wks. or 42 wks.
Klein, 1951a	72 mice	Albino	M	0.004 or 0.024 cc. of 1% croton oil in olive oil	S.C.	62 sarc.	----	At least 116 d.
	72 mice	Albino	M	0.024 or 0.04 mg. in 0.04 cc. olive oil	S.C.	29 sarc.	----	At least 269 d.
Klein, 1951b	10 mice	C	M	Crystals with minced fetal skin	Intrasplenic	8[41]	----	175 d. average
	20 mice	C	M	1.0% in olive oil, 0.03 with minced fetal skin	Intrahepatic	8 epi.	----	258 d. average
	26 mice	C	M	Crystals with minced fetal skin	Intratesticular	6[42]	----	297 d. average
	32 mice	C	M	1.0% in olive oil, 0.03 with minced fetal skin	I.M.	27[43]	----	151 d. average
	32 mice	C	M	1% in olive oil, 0.03 cc. with minced fetal skin	S.C.	28[44]	----	167 d. average

[34] 25 carcinomas, 4 sarcomas, 11 papillomas of stomach; 14 pulmonary adenomas; 1 lymphoma, 1 squamous carcinoma of ear.
[35] 6 squamous carcinomas, 5 papillomas of stomach; 2 pulmonary adenomas, 1 duodenal polyp, 1 squamous carcinoma of anterior abdominal wall.
[36] Stomach tube.
[37] 5 squamous carcinomas of forestomach.
[38] Squamous carcinoma of forestomach
[39] Local, at injection site.
[40] Carcinoma of bladder.
[41] 4 sarcomas, 3 squamous cell carcinomas, 1 mixed tumor.
[42] 2 sarcomas, 4 squamous cell carcinomas.
[43] 17 fibrosarcomas, 9 squamous cell carcinomas, 1 mixed tumor.
[44] 20 sarcomas, 6 squamous cell carcinomas, 1 papilloma, 1 mixed tumor.

Reference	Animal	Strain or type	Sex	Preparation and dose	Site and route	Animals with tumors	Survival	Duration of experiment
575. --20-METHYLCHOLANTHRENE--Continued								
Klein, 1951b	19 mice	C	M	Crystals with minced fetal skin	S.C.	2 sarc.	----	261 d. average
	10 mice	C	M	1.0% in olive oil, 0.03 cc. with minced fetal skin	Intrasplenic	6[45]	----	At least 186 d.
Klein, 1951c	80 mice	dba	M	0.5% soln. in olive oil once	Skin	0	----	264 d. or 329 d.
	96 mice	dba	M	0.5% soln. in olive oil once, 5% croton oil in olive oil 53 or 70 applications	Skin	90 pap.	----	At least 177 d.
	40 mice	dba	M	0.5% in olive oil once, followed by 127 applications of olive oil daily	Skin	0	----	307 d.
Lutz et al., 1951	9 hamsters	Syrian golden	----	0.25 cc. of 0.4% in oil of lard, 6 weekly injections	S.C.	Tumors[46]	----	----
Maisin, 1951	250 mice	----	M&F	----	----	Tumors[47]	147 alive	210 d.
Morton et al., 1951	80 mice	dba	M&F	0.5% in benzene twice weekly[48]	Skin	12 epi.[49]	----	7 mos.
O'Flynn, 1951	30 mice	White	M	0.004 mg. in 0.1 ml. peanut oil, 1 injection	S.C.	25 sarc.	----	196 d.
	30 mice	White	M	0.004 mg. in 0.1 ml. peanut oil, 2 injections 6 wk. interval	S.C.	20 sarc.[50]	28 alive at 108 d.	196 d.
	Mice	White	M	0.004 mg. in 0.1 ml. peanut oil once followed by 0.004 mg. in 0.1 ml. peanut oil once	S.C.	3 sarc.[51]	----	----
Orr, 1951	Mice	IF[52]	----	16 drops of a 0.5% soln. in almond oil every 2 wks., 3 to 9 times	Skin	31[53]	26 alive at 10 wks.	----
Riegel et al., 1951	48 mice	CF1	M&F	0.15% in acetone twice weekly for 31 wks.	Skin	34 epi. 8 pap.	48 alive at 8 wks.	31 wks.
Russell and Loquvam, 1951	86 pullets	Leghorn	----	30% pellets fused with chemically pure cholesterol	Right cerebral hemisphere	0	48 survived initial operation, 31 alive at 2 yrs.	56 mos.
Shay et al., 1951c	25 rats	Wistar	M	2 mg. in 1 cc. heated olive oil daily, 6 d. per wk.	P.O.	5[54]	16 autopsied	20 mos.
	50 rats	Wistar	M	2 mg. in 0.5 or 1.0 cc. unheated olive oil daily 6 d. per wk.	P.O.	26[55]	34 autopsied	20 mos.
Shay et al., 1951b	59 rats	Wistar	M&F	2 mg. in olive oil, 0.5 cc. daily 6 d. per wk. for 1 to 14 mos.	P.O.[56]	Tumors[57]	----	14 mos.
Shay et al., 1951a	Rats	Wistar	----	----	P.O.[56]	0[57a]	----	----

[45] 5 squamous cell carcinomas, 1 mixed tumor.
[46] 5 spindle cell sarcomas.
[47] 99 carcinomas, 151 other tumors.
[48] Kept in dark.
[49] Also 65 leukemias.
[50] 3 at site of first injection, 17 at site of second injection.
[51] At site of second injection.
[52] Bonser's low breast cancer strain.
[53] Mammary adenocarcinomas, spindle cell sarcomas and carcino-sarcomas.
[54] 1 fibroma, 4 fibrosarcomas.
[55] 4 fibromas, 18 fibrosarcomas, 4 lymphomas.
[56] Stomach tube.
[57] 6 lymphatic leukemias, 2 myelogenous leukemias.
[57a] 3 myeloid leukemias.

Reference	Animal	Strain or type	Sex	Preparation and dose	Site and route	Animals with tumors	Survival	Duration of experiment
575.--20-METHYLCHOLANTHRENE--Continued								
Steiner and Falk, 1951	50 mice	C57 black	M&F	0.2 mg. in 0.5 cc. tricaprylin	S.C.	25 sarc.	45 alive at 4 mos.	22 mos.
Strong, 1951a	641 mice	Brp (descendants of NH)	M&F	1 mg. in 0.1 cc. sesame oil	S.C.	Tumors[58]	----	----
	3734 mice	Br subline of NH	M&F	1 mg. in 0.1 cc. sesame oil	S.C.	Tumors[60]	----	----
Strong, 1951b	3247 mice	2NHO	M&F	1 mg. in 0.1 cc. sesame oil	S.C.	Tumors[59]	----	----
Strong and Sanghri, 1951	2792 mice	NHFu-20	M&F	1 mg. in 0.1 ml. sesame oil	S.C.	2231[61]	----	900 d.
Breedis, 1952	34 salamanders	Triturus viridescens	----	1 mg. (approx.) of crystals wet with olive oil	S.C.	2 sarc.[62]	----	At least 130 d.
Cambel, 1952	75 mice	Swiss	F	0.6% in benzene 3 times a week	Skin	Tumors[63]	----	18 mos.
Davibhadhana, 1952	Mice	Swiss	F	0.6% in benzene, 24 applications	Skin	0	----	60 d.
Duran-Reynals, 1952	104 chickens[64]	Plymouth Rock	----	0.3% in ether, mineral oil, 82 - 155 applications in 8.5 - 14 mos.	Skin	Tumors[65]	30% alive at 15 mos.	Over 2 yrs.
	28 chickens[66]	Plymouth Rock	----	0.3% in ether, mineral oil	Skin	Tumors[67]	----	----
	45 pigeons[68]	----	----	0.3% in ether, mineral oil twice weekly for 3 - 8 mos., 15 - 63 paintings	Skin	100% pap., 15.6% epi.[69]	----	----
Eldredge and Luck, 1952	2 rats	Sprague-Dawley	M	Two 0.5 cc. doses in sesame oil (10 mg. per cc.)	S.C.	Sarc.	----	----
Figge, 1952	1 monkey	----	F	5 mg. in sesame oil, plus several injections of 4 mg. of hematoporphyrin	I.M.	Tumors[70]	----	2.5 yrs.
Fleming, 1952	250 mice	dba	M&F	Tooth germs, transplants and crystals	S.C.	0[71]	Sacrificed at various intervals	50 - 80 d.
Hare et al., 1952	300 rats	Osborne-Mendel Marshall 520 & A x C	----	0.6 mg., aqueous suspension with Aerosol O.T.	Intramural injection into glandular stomach at various sites	Tumors[72]	35 died after operation	----

[58] Total number 512. 68.5% local fibrosarcomas, 8.9% lung tumors, 23.7% stomach tumors.
[59] Fibrosarcomas and 21.6% with lung adenomas.
[60] Total number 2960. 70.4% local sarcomas, 9.0% lung tumors, 20.9 stomach tumors.
[61] Various types at site of injection and elsewhere, including various types of sarcoma, epidermoid carcinoma, mammary carcinoma, epidermoid carcinoma of stomach, adenoma of lung and hepatomas.
[62] 1 developing in an accessory limb.
[63] 1 mouse with a fibrosarcoma and adjacent mastocytoma.
[64] 3 or 30 day old chicks injected with fowl pox and given sex hormones additionally.
[65] 104 papillomas, 59 angiomas, 46 squamous cell carcinomas.
[66] Adults injected with fowl pox.
[67] Papillomas, angiomas, squamous cell carcinomas.
[68] Injected with pigeon pox.
[69] 2 with metastases.
[70] Myoma of the cervical wall.
[71] Various histological changes described including "invasive behavior of epithelial cells".
[72] 4 adenocarcinomas, 4 adeno-acanthomas, 3 mixed carcinoma-sarcomas, 16 sarcomas, 1 unclassified malignancy, all of stomach. Adenomatous diverticulum in 220 rats.

Reference	Animal	Strain or type	Sex	Preparation and dose	Site and route	Animals with tumors	Survival	Duration of experiment
575.--20-METHYLCHOLANTHRENE--Continued								
Heston and Deringer, 1952	105 guinea pigs	2, 13	M&F	30 mg. dispersed in horse serum or water	I.V.	43[73]	----	58 mos. - 62 mos.
	2 guinea pigs	13	M	10 or 20 mg. dispersed in horse serum	I.V.	0	16 alive at 21 mos.	21 mos.
Horning, 1952	35 mice	A, C3H	M	Crystals and prostate tissue graft	S.C.	Tumors[74]	----	16 wks.
Iversen et al., 1953	195 mice	ST/EH	M&F	0.5 - 2% in benzene once, followed after 251 days by 0.5% croton oil in alcohol, twice weekly	Skin	Tumors[75]	----	Over 300 d.
Klein, 1952b	80 mice	Albino	M	0.02 or 0.05 mg. per ml. of 1% soln. of croton oil in olive oil (0.04 ml. per mouse)	I.M.	4 sarc.[76]	----	355 d. avg.
	120 mice	Albino	M	0.01 - 0.05 mg. per ml. olive oil (0.04 ml. per mouse)	I.M.	6 sarc.[77]	----	362 d. avg.
	40 mice	Albino	M	0.01 mg. per ml. 1% soln. of croton oil in oiive oil (0.04 ml. mouse)	I.M.	0	----	391 d. avg.
Kobernick et al., 1952	30 rats	Piebald	M	0.25 soln. in polyethylene glycol 300, 3 times weekly	Exteriorized gastric mucosa	0	----	1 yr.
	30 rats	Piebald	M	Impregnated thread	Exteriorized gastric mucosa flaps	0	----	1 yr.
Laurens and Bacon, 1952	6 rats	Wistar	----	0.5% in paraffin oil, 1 cc.	S.C. rectum[78]	0	3 died by 81 d.	163 d.
	9 rats	Wistar	----	0.5% in paraffin oil, 1 cc. in gelatin capsule every 21 d.	Rectum	0	8 alive at 175 d.	185 d.
	6 rats	Wistar	----	0.5% in paraffin oil, 1 cc.	S.C. rectum	1 sarc.[79]	5 alive at 120 d.	120 d.
	12 rats	Wistar	----	0.5% in paraffin oil, 1.0 cc.	S.C.	0	----	120 d.
	6 rats	Wistar	----	0.5% in paraffin oil	Rectal mucosa	Tumors[80]	----	120 d.
	6 rats	Wistar	----	0.5% in paraffin oil	Rectal sub-mucosa	0	Several died of infection	185 d.
	9 rats	Wistar	----	0.5% in paraffin oil in a gelatin capsule	Rectum	0	Several died of infection	185 d.
Law, 1952	269 mice	DWF_1 x W, W x DWF_1 (combined)	M&F	0.2% in ether 3 times weekly for 20 wks.	Skin	Tumors[81]	Mean age at death from leukemia 14.0 mos.	At least 14 mos.

[73] 2 uterine fibromas, 32 pulmonary tumors, 4 fibrosarcomas, 1 hepatoma, 3 stomach adenocarcinomas, 1 gall bladder carcinoma, 1 reticulum cell sarcoma.
[74] 13 carcinomas, some squamous cell, some glandular and some mixed.
[75] 70 tumors, type not specified.
[76] Mean latent period 185-272 days.
[77] Mean latent period 183-254 days.
[78] With colostomy.
[79] Intra-abdominal, probably from rectal wall.
[80] Sarcoma.
[81] 79 leukemias, 2 lymph-node hemangio-endotheliomas; hepatoma, 22 carcinomas of skin; 23 pulmonary adenomas, 20 breast adenocarcinomas.

Reference	Animal	Strain or type	Sex	Preparation and dose	Site and route	Animals with tumors	Survival	Duration of experiment
575.--20-METHYLCHOLANTHRENE--Continued								
Law, 1952	66 mice	WDF_1 cross	M&F	0.2% in ether 3 times weekly for 20 wks.	Skin	Tumors[82]	Mean age at death from leukemia 17.5 mos.	At least 17.5 mos.
	96 mice	DWF_1 cross	M&F	0.2% in ether 3 times weekly for 20 wks.	Skin	Tumors[83]	Mean age at death from leukemia 15.2 mos.	At least 15.2 mos.
	14 mice	WA	----	----	Skin	Tumors[84]	----	At least 8 mos.
	64 mice	dba	----	0.2% in ether 3 times weekly for 20 wks.	Skin	Tumors[85]	Mean age at death from leukemia 9.5 mos.	At least 9.5 mos.
Moon et al., 1952	15 rats[86]	Long-Evans	F	Pellets	I.M.	1 sarc.	9 alive at 199 d.	316 d.
	15 rats	Long-Evans	F	Pellets	I.M.	8 sarc.	----	299 d.
Richardson et al., 1952	16 rats	Sprague-Dawley	F	0.1 ml. of a 0.6% soln. in benzene weekly	Vaginal instillation	0	----	55 wks.
Rigdon, 1952	5 ducks	Pekin	----	10 mg. per ml. liquid petrolatum, 1 or 3 injections (total 3.0 ml.)	S.C.	0	1 died 320 d.	At least 366 d.
	19 ducks	Pekin	----	10 mg. per ml. of liquid petrolatum, 1 or 3 injections (total 1.0 - 3.0 ml.)	I.M.	2 sarc.	13 alive at 367 d.	550 - 587 d.
	12 ducks	Pekin	----	8 mg. in sesame oil, 1 injection (total 0.2 - 1 ml.)	S.C. I.M.	0	8 alive at 289 d.	289 - 661 d.
	15 ducks	Pekin	----	0.2 or 0.25% in acetone for 33 - 66 d.	Skin	Tumors[87]	10 alive at 182 d.	182 - 366 d.
Russell et al., 1952	98 guinea pigs	----	M&F	10 mg. per cc. in sesame oil, 3 injections every 2 wks.	S.C.	Tumors[88]	----	588 d.
Russell and Ortega, 1952	98 guinea pigs	----	M&F	10 mg. per cc. in sesame oil, three doses with 2 wk. interval.	S.C.	39[89]	73 alive at 170 d.	588 d.
Schlumberger, 1952	Cockroaches	----	----	Crystals	Body cavity (abdominal incision)	0	----	365 d.

[82] 13 leukemias, 2 granulosa cell (ovary); 1 tumor of cervix, 5 hepatomas, 4 carcinoma of skin; 19 lung adenomas, 3 breast adenocarcinomas.
[83] 37 leukemias, 22 breast adenocarcinomas, 1 tumor of cervix, 6 carcinomas of skin, 20 pulmonary adenomas.
[84] 1 lymphocytic leukemia. No leukemia observed in untreated WA mice.
[85] 69.7% with leukemia.
[86] Hypophysectomized.
[87] 13 papillomas, 4 epitheliomas, 8 hemangiomas.
[88] 27 sarcomas, 12 liposarcomas, 7 osteosarcomas, 17 fibrosarcomas, 3 osteogenic sarcomas. Average latent period at least 242 days.
[89] 17 fibrosarcomas, 10 osteosarcomas, 12 liposarcomas. First tumor appeared at 170 days.

Reference	Animal	Strain or type	Sex	Preparation and dose	Site and route	Animals with tumors	Survival	Duration of experiment
575.--20-METHYLCHOLANTHRENE--Continued								
Shay et al., 1952a	18 rats	Wistar	F	2 mg. in 0.2 cc. olive oil daily for 2 mos.	P.O.[90]	Tumors[92]	----	At least 2 mos.
Shay et al., 1952b	60 rats	Wistar	M&F	2 mg. in 0.5 cc. olive oil daily until death	P.O.[90]	37[91]	----	175 d. average
Silverstone et al., 1952	176 mice	dba	M	0.3% in acetone, 12 weekly applications, semi-purified and stock diet	Skin	15 pap., 144 epi.	----	48 wks.
Strong, 1952	556 mice	Prunt	F	1 mg. in 0.1 cc. of sesame oil	S.C.	100% sarc.	----	----
Weil et al., 1952	75 mice	ABC	M	0.25 mg. in 0.0625 ml. lard per injection, 2 injections	S.C.	22[93]	38 alive	5 mos.
	71 mice	CFW	M	0.25 mg. in 0.0625 ml. lard per injection, 2 or 3 injections	S.C.	15[94]	31 alive	5 mos.
	71 mice	CF1	M	0.25 mg. in 0.0625 ml. lard per injection, 2 or 3 injections	S.C.	13[95]	30 alive	5 mos. or 9 mos.
Allen, 1953	Rats	Hybrid	M	3% suspension in distilled water (total injected dose 1.5 mg. crystalline)	Prostate	Tumors[96]	17 alive	180 d.
	Rats	Hybrid	M, castr.	3% suspension in distilled water (total injected dose 1.5 mg. crystalline)	Coagulating gland	Tumors[97]	26 alive	180 d.
	Rats	Hybrid	M, castr.	3% suspension in distilled water (total injected dose 1.5 mg. crystalline)	Prostate	Tumors[98]	28 alive	180 d.
Andervont and Dunn, 1953	44 mice	$dba_f/2$	F	1 mg. in 0.2 cc. olive oil weekly for 9 wks.	P.O.	Tumors[99]	----	1 yr.
Benelli et al., 1953	40 mice	----	M&F	3 x 0.25 ml. of a 5% soln. in olive oil	S.C.	35[100]	28 alive at 31 wks.	20 - 31 wks.
Foley, 1953	Mice	C3H	M&F	Crystals	S.C.	Sarc.	----	At least 8 wks.
	Mice	C3H	M&F	1 mg. in 0.05 ml. lard	S.C.	Sarc.	----	Over 90 d.
Ghiringhelli et al., 1953	10 rats	Albino	M	0.25% in oil, 1 ml. every 2 wks. (total of 4 injections)	S.C.	8 sarc.	9 alive	140 d.
	18 rats[101]	Albino	M	0.25% in oil, 4 injections of 1 ml. each at 2 wk. intervals	S.C.	10 sarc.	12 alive	140 d.
Kirschbaum et al., 1953	108 mice	BALB/C	M&F	0.25% in benzene 3 times weekly, 18 applications	Skin	Tumors	----	400 d.

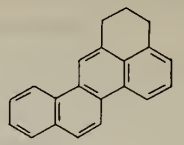
[90] Stomach tube.
[91] 35 mammary tumors, 2 sarcomas.
[92] In 35 F_1 offspring, 6 had 3 fibro-adenomas of breast, 1 pituitary adenoma, 2 reticulum cell sarcoma and 1 lymphosarcoma.
[93] 13 of 66 surviving lard injected ABC controls had lung tumors.
[94] 19 of 67 surviving lard injected CFW controls had lung tumors.
[95] 23 of 49 surviving lard injected CF1 controls had lung tumors.
[96] 70.6% with tumors, mostly squamous cell carcinoma; a small percentage of sarcomas.
[97] 84.7% with tumors, mostly squamous cell carcinoma; a small percentage with sarcomas.
[98] 100% with tumors, mostly squamous cell carcinoma; a small percentage with sarcomas.
[99] 14 with mammary tumors, (3 adenocarcinomas, 7 carcinosarcomas, 1 adenoacanthoma and 4 sarcomas); also 26 mediastinal lymphosarcomas and 2 pulmonary adenomas.
[100] Type not specified.
[101] 8 rats hypophysectomized 10 days before treatment; 10 rats hypophysectomized 60 days after treatment.

Reference	Animal	Strain or type	Sex	Preparation and dose	Site and route	Animals with tumors	Survival	Duration of experiment
575.--20-METHYLCHOLANTHRENE--Continued								
Klein, 1953a	159 mice	dba/JAX$_2$	M	0.5% in olive oil once, followed by 1 application of 10% soln. of croton oil in olive oil. Also followed by 39 - 64 applications of 5% croton oil in olive oil.	Skin	63 pap.	127 alive at time of first tumor	202 - 402 d.
Klein, 1953c	102 mice	dba/2JAX	M	0.5% in olive oil once, followed by croton oil	Skin	40 pap.	----	220 d. or 400 d.
Klein, 1953b	30 mice	dba/2JAX	M	0.5% in olive oil once, ears also wounded	Skin (ears)	0	----	194 d.
	30 mice	dba/2JAX	M	0.5% in olive oil once, ears wounded and treated twice weekly for 20 wks. with croton oil	Skin (ears)	Tumors[102]	----	189 d.
Marchant and Orr, 1953	50 mice	White	----	0.3% in acetone once weekly for 12 wks.	Skin	5 pap., 33 epi.	----	230 - 280 d.
	Mice	White	----	0.3% in acetone once weekly for 12 wks., with skin grafting	Skin	8 pap., 9 epi.	32 alive at 47 d.	230 - 250 d.
	15 mice	White	----	0.3% in acetone once weekly for 12 wks., subcutaneously placed threads	Skin	1 pap., 13 epi.	----	280 d.
	19 mice	White	----	0.3% in acetone once weekly for 12 wks., dermis stimulated electrically	Skin	2 pap., 8 epi.	----	214 d.
	Mice	White	----	0.3% in acetone once weekly for 12 wks., skin grafted and croton oil applied	Skin	8 epi., 17 pap.[103] [104]	----	Over 430 d.
Saxén, 1953	190 mice	C3H	M	0.0045 - 0.225 mg. in 0.03 - 1.5 cc. tricaprylin, 1 inj.	S.C.	147 sarc.[105]	----	180 - 360 d.
Stewart et al., 1953	59 mice	BALB/c	M&F	0.01 cc. of a methocel suspension containing 0.3 mg.	S.C. wall of stomach	Tumors[106]	----	22 mos.
	70 mice	A	M&F	0.01 cc. of a methocel suspension containing 0.3 mg.	S.C.	Tumors[107]	----	22 mos.
	68 mice	dba	M&F	0.01 cc. of a methocel suspension containing 0.3 mg.	S.C.	Tumors[108]	----	22 mos.
	73 mice	C3Hb	M&F	0.01 cc. of a methocel suspension containing 0.3 mg.	S.C.	Tumors[109]	----	22 mos.
	91 mice	C3H	M&F	0.01 cc. of a methocel suspension containing 0.3 mg.	S.C.	Tumors[110]	----	22 mos.
	111 mice	C57 Bl	M&F	0.01 cc. of a methocel suspension containing 0.3 mg.	S.C.	Tumors[111]	----	22 mos.

[102] 13 mice with 17 skin tumors, types not specified; average latent period 131 days.
[103] On grafts and on original site.
[104] Also 1 angioma.
[105] Myoblastic sarcomas, rhabdomyosarcoma, round and spindle cell sarcoma. Latent period at least 95 day average.
[106] 30 precancerous lesions, 3 adenocarcinomas, 1 adeno-acanthoma, 9 mixed adenocarcinoma-sarcomas, 3 mixed adeno-acanthoma-sarcomas, 7 sarcomas and 1 haemangioendothelioma with metastases, all of the stomach.
[107] 40 precancerous lesions, 5 adenocarcinomas, 2 adeno-acanthomas, 10 mixed adenocarcinoma-sarcoma and 6 sarcomas, all of the stomach.
[108] 5 precancerous lesions, 1 mixed adenocarcinoma-sarcoma, 2 sarcomas of the stomach.
[109] 28 precancerous lesions, 5 adenocarcinomas 2 adeno-acanthomas, 8 mixed adenocarcinoma-sarcomas, 12 sarcomas, all of the stomach. Also 1 haemangioendothelioma with metastases.
[110] 36 precancerous lesions, 8 adenocarcinomas, 1 adeno-acanthoma, 13 mixed adenocarcinoma-sarcomas, 1 adeno-acanthoma-sarcoma and 7 sarcomas, all of stomach, Also 1 osteogenic-sarcoma.
[111] 82 precancerous lesions, 2 adenocarcinomas, 1 adeno-acanthoma, 5 mixed adenocarcinoma and sarcoma, 1 mixed adeno-acanthoma and sarcoma and 1 sarcoma, all of the stomach.

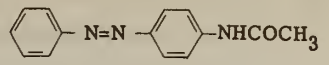
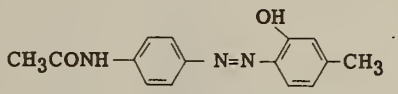
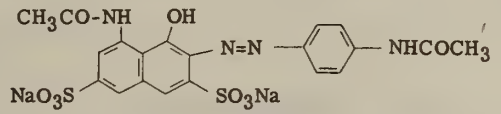
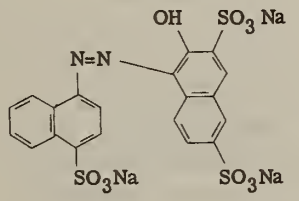
Reference	Animal	Strain or type	Sex	Preparation and dose	Site and route	Animals with tumors	Survival	Duration of experiment
575.--20-METHYLCHOLANTHRENE--Continued								
Sulzberger et al., 1953	65 mice	Swiss	----	0.6% in benzene 3 times weekly for 6 wks., plus 0.5 mg. cortisone daily	Skin	41 tumors[112]	59 alive at 5 wks.	Over 15 wks.
	47 mice	Swiss	----	0.6% in benzene 3 times weekly for 6 wks., plus daily injections of saline	Skin	22 tumors[112]	46 alive at 3 wks.	Over 18 wks.
	65 mice	Swiss	----	0.3% in carbowax 1500, 3 times weekly for 6 wks., plus 0.5 mg. cortisone daily	Skin	14 tumors[112]	58 alive at 8 wks.	Over 15 wks.
	47 mice	Swiss	----	0.3% in carbowax 1500, 3 times weekly for 6 wks., plus daily injection of saline	Skin	4 tumors[112]	45 alive at 6 wks.	Over 15 wks.
Tannenbaum and Silverstone, 1953	150 mice	C3H	M	0.1% in acetone, 17 applications at twice weekly intervals[116]	Skin	109 pap. & epi.	----	51 wks.
Thamsen, 1953	Mice	C3H/Eh	----	Crystal plus foetal lung graft to anterior chamber	Eye	Tumors[117]	----	Over 212 d.
	24 mice	St/Jn	----	Crystal plus foetal lung graft to anterior chamber	Eye	Tumors[118]	----	At least 285 d.
	20 mice	St/Eh	----	Crystal plus foetal lung graft to anterior chamber	Eye	0	----	280 d.
	26 mice	dba/Eh	----	Crystal plus foetal lung tissue to the anterior chamber	Eye	Tumors[119]	----	At least 370 d.
Klein (unpub. data)	26 mice	BALB/C	F	0.1% in olive oil 3 times weekly	Intravaginal	2[120]	12 alive at 13 mos.	13 mos.
	21 mice	BALB/C	F	0.1% in olive oil 3 times weekly, plus 1% croton oil in olive oil	Intravaginal	7[121]	11 alive at 10 mos.	13 mos.
	25 mice	BALB/C	F	0.1% in olive oil once, followed by 1% croton oil in olive oil 3 times weekly	Intravaginal	0	10 alive at 15 mos.	15 mos.
Weil et al., (unpub. data)	30 mice	C3H	M	1 ml. = 0.002 gm. in benzene, 3 times weekly	Skin	Tumors[122]	----	1 yr.
	30 mice	RAP	M	1 ml. = 0.002 gm. in benzene, 3 times weekly	Skin	Tumors[122a]	----	1 yr.
	30 mice	RAP	M	1 ml. = 0.008 gm. in benzene, 3 times weekly	Skin	Tumors[123]	----	1 yr.
	30 mice	RAP	M	1 ml. = 0.005 gm. in benzene, 3 times weekly	Skin	Tumors[123a]	----	1 yr.

[112] Of the skin. Pathology not specified.
[116] Various percentage of minerals in diet.
[117] 2 benign adenomas and 1 adenocarcinoma of lungs in 20 grafts after 170-212 days.
[118] 2 benign lung adenomas after 230-285 days.
[119] 2 carcinomas and 1 adenoma of the lung after 64 to 370 days.
[120] Squamous cell carcinomas of vagina.
[121] 5 mice with squamous cell carcinomas, 2 with papillomas of vagina.
[122] Of effective totals 100% had papilloma and 100% had epithelioma. Average latent period 145 days.
[122a] Of effective totals 92.9% had papillomas and 61.9% had epitheliomas. Average latent period 112 days.
[123] Of effective totals 84.0% had papillomas and 57.1% had epitheliomas. Average latent period 130 days.
[123a] Of effective totals 85.7% had papillomas and 61.5% had epitheliomas. Average latent period 190 days.

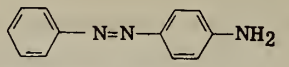
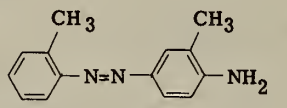
Reference	Animal	Strain or type	Sex	Preparation and dose	Site and route	Animals with tumors	Survival	Duration of experiment
576.--1,12-TRIMETHYLENECHRYSENE 								
Kleinenberg, 1941	19 mice	R-U	M&F	0.5% in olive oil, 0.4 cc., 3 times	S.C.	Tumors[124]	13 alive at 8 mos.	At least 8 mos.
	21 mice	R-U	M&F	0.5% in olive oil, every other day	Skin	4 pap.[125]	20 alive at 8 mos.	At least 21.5 mos.

[124] Adenocarcinoma of mammary gland. Also 1 sebaceous gland tumor, subsequently absorbed, 1 tumor of left hind paw, 1 lymphosarcoma of the thyroid, 1 cystadenoma of the uterus, and 3 benign lung adenomas.

[125] Also 1 tumor of the sebaceous gland, 1 mammary tumor and 9 apparently benign lung adenomas.

Reference	Animal	Strain or type	Sex	Preparation and dose	Site and route	Animals with tumors	Survival	Duration of experiment
577. --4-ACETYLAMINOAZOBENZENE 								
Druckrey and Danneberg (unpub. data)	50 rats	BD 1 and BD III	----	Up to 6 mg. (total dose 3 g.)	P.O.	0	27 alive after 1 yr.	32 mos.
578. --4-ACETYLAMINOBENZENEAZO-2'-HYDROXY-4'-METHYLBENZENE 								
Hackmann, 1951a	20 rats	Heterozygotic	----	0.1% in the diet	P.O.	0	14 alive after 1 yr., 1 at 2 yrs.	At least 2 yrs.
579. --ACID RED 6B[126] 								
Miller (unpub. data)	Mice	GFF	M&F	1.25% aqueous in water, ad lib.	P.O.	0	Majority dead at 18 mos.	At least 18 mos.
	Mice	GFF	M&F	0.5 cc. 2.5% suspension in arachis oil per mouse (12.5 mg. dye per mouse per injection, up to 33 injections)	S.C.	0	Majority dead at 18 mos.	At least 18 mos.
	Mice	GFF	M&F	5.0 aqueous soln. on bread, 100 mg. dye per mouse daily except Sundays	P.O.	0	Majority dead at 18 mos.	At least 18 mos.
	12 rats	Scott Hooded	M&F	Feeding and drinking on alternate weeks. 1.25% aqueous in water, ad lib. or 200 mg. per rat in diet, daily except Sundays.	P.O.	0	Majority alive at 18 mos.	At least 18 mos.
	Mice	GFF	M&F	1.0% soln. in 90% ethyl alcohol, 3 times weekly, 2 stroked	Skin	0	Majority dead at 18 mos.	At least 18 mos.
580. --AMARANTH[127] 								
Willheim and Ivy, 1953	10 rats	Wistar	M&F	4% of the diet	P.O.	Tumors[128]	----	18 mos. to 2 yrs.

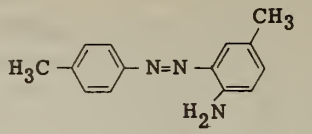
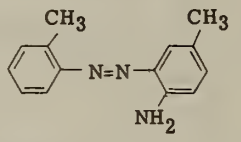
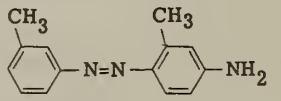
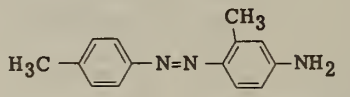
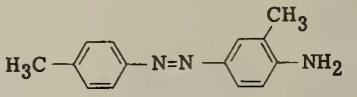
[126] Color Index No. 57.
[127] FD & C Red 2.
[128] 1 lymphosarcoma (50 controls had no tumors).

Reference	Animal	Strain or type	Sex	Preparation and dose	Site and route	Animals with tumors	Survival	Duration of experiment
581.--p-AMINOAZOBENZENE 								
Kirby, 1947b	31 rats	Wistar	M&F	0.25 or 1.0% in diet for 45 wks. or 18 mos.	P.O.	Tumors[129]	15 alive at 527 d.	2 yrs.
Griffin and Baumann, 1948a	Rats	Sprague-Dawley	----	0.054% in the diet	P.O.	0	----	16 wks.
Miller and Miller, 1948	12 rats	Sprague-Dawley	M	0.106% in the diet for 9 mos.	P.O.	0	----	9 mos.
Hoffman and Schectman, 1952	5 rats	Long-Evans	F	0.06% in the diet for 5 wks.	P.O.	0	----	5 wks.
Druckrey and Danneberg (unpub. data)	13 rats	BD I and BD III	----	Until 10 mg. (total dose until 600 mg.)	P.O.	0	6 alive at 1 yr.	32 mos.
582.--o-AMINOAZOTOLUENE 								
Yoshida, 1934b	30 rats	White	----	10% in olive oil, 0.2 and 0.5 cc. every 2-4 wks.	S.C.	0[130]	6 alive at 200 d.	At least 448 d.
Gallico and Boretti, 1948	15 rats	----	----	0.1% in the diet	P.O.	2	Killed at intervals	16 mos.
Silverstone, 1948b	100 mice	dba	F	0.05% in the diet for 11 alternate weeks over a period of 23 wks.[131]	P.O.	26[132]	----	45 wks.
	130 mice	dba	M&F	10 mg. in 0.2 cc. olive oil, 7 or 9 injections at monthly intervals[131]	S.C.	29[132]	----	12 mos.
Crabtree, 1949	30 rats	52	M&F	0.06% in the diet	P.O.	Tumors[133]	----	595 d.
	40 mice	Simpson	M&F	0.06% in the diet	P.O.	Tumors[134]	----	595 d.
Peacock and Peacock, 1949	10 fowls	BL	F	0.5 to 1.5 ml. of a 5% soln. in lard	I.M.	0	Most died in 2 yrs.	At least 2 yrs.
Andervont, 1950a	20 mice	C	F	5 mg. in tricaprylin, 8 injections	S.C.	Tumors[135]	----	----
	20 mice	C	F	5 mg. in sesame oil, 8 injections	S.C.	Tumors[136]	----	----
	168 mice	C and A	M&F	In olive oil (total dose 20 - 40 mg.)	S.C.	Tumors[137]	----	----
	89 mice	C57Bl, C3H and A	M&F	In olive oil, 9 injections	S.C.	Tumors[138]	----	----

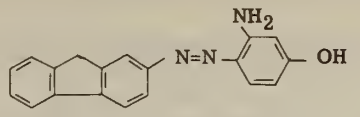
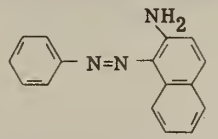
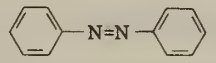
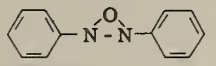
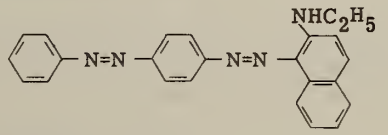
[129] Hepatomas and bile duct carcinomas in 7 rats. Also 2 papillomas of the stomach, not believed attributable to the dye.
[130] 4 animals had 1 liver carcinoma, 2 skin carcinomas, and 3 cysticercus sarcomas.
[131] Rice or Purina chow diet.
[132] Hepatomas.
[133] 8 hepatomas and cholangiomas.
[134] 10 hepatomas and cholangiomas.
[135] 3 hemangio-endotheliomas at various sites.
[136] 4 hemangio-endotheliomas at various sites.
[137] 2 hemangio-endotheliomas in pleural cavity; 13 sarcomas at site of injection.
[138] 6 hemangio-endotheliomas at various sites; 5 local sarcomas.

Reference	Animal	Strain or type	Sex	Preparation and dose	Site and route	Animals with tumors	Survival	Duration of experiment
582.--o-AMINOAZOTOLUENE--Continued								
Andervont, 1950a	120 mice	C	F	5 - 10 mg. crystals with glycerol, 8 or 3 injections	S.C.	Tumors[139]	----	----
	348 mice	C	M&F	10 mg. crystals with 5 drops glycerol, 7 or 4 injections	S.C.	Tumors[140]	----	----
	100 mice	A	F	10 mg. crystals with 5 drops glycerol, 2, 3, 4, 5 or 6 injections	S.C.	Tumors[141]	----	----
	116 mice	A, C3H, C and C57Bl	M&F	200 mg. crystals moistened with 6 drops glycerol, 10 injections	S.C.	Tumors[142]	----	15 mos.
	60 mice	C	M&F	100-200 mg. mixed with diet	P.O.	Tumors[143]	----	----
Wilson et al., 1950	Mice	----	----	----	----	Tumors[144]	----	----
Taki, 1951	Rats	Albino	----	0.1% in the diet, over 30 wks.	P.O.	0	Sacrificed at intervals	Over 30 wks.
	Mice	----	----	0.1% in the diet for 30 d.	P.O.	0	Sacrificed at intervals	At least 10 wks.
Weil et al., 1952	135 mice	C3H	M	2.5 or 5.0 mg. in 0.125 or 0.25 ml. lard per injections, 2-10, or 20 injections	S.C.	26[145]	96 alive	5 mos.
	60 mice	ABC	M	5.0 mg. in 0.25 ml. lard per injection, 2 to 10 injections	S.C.	25[146]	56 alive	5 mos.
	50 mice	C57 black	M	2.5 mg. in 0.125 ml. lard per injection, 38 injections	S.C.	1[147]	23 alive	9 mos.
Gel'shtein, 1953	221 mice	C3HA	M&F	1% soln. in benzol, 3 times weekly (approx. 1 mg. per dose)	Skin	Tumors[148]	----	3 mos.
	188 mice	CC57	M&F	1% soln. in benzol, 3 times weekly (approx. 1 mg. per dose)	Skin	Tumors[149]	----	3 mos.
Nelson and Woodard, 1953	10 dogs	Irish terrier, mongrel	M&F	5 or 20 mg. per kg. body wt. per day in the diet	P.O.	4[150]	5 dogs died within 8 wks.	62 mos.

[139] 18 hemangio-endotheliomas at various sites.
[140] 75 hemangio-endotheliomas at various sites.
[141] 16 hemangio-endotheliomas at various sites.
[142] 33 hemangio-endotheliomas at various sites.
[143] 22 hemangio-endotheliomas at various sites.
[144] Cirrhosis and hepatomas.
[145] 38 of 128 surviving lard injected C3H controls had lung tumors.
[146] 18 of 51 surviving lard injected ABC controls had lung tumors.
[147] 2 of 44 surviving lard injected C57 controls had lung tumors.
[148] 18 males and 16 females with liver nodules. Liver adenomas appeared after 20 mg. given in 6 weeks.
[149] 4 males and 9 females with liver nodules. Liver adenomas appeared after 20 mg. given in 6 weeks.
[150] 2 carcinomas of the bladder, 2 carcinomas of the gall bladder, 1 cholangioma and hepatoma.

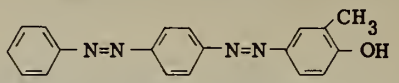
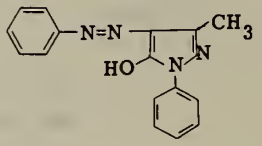
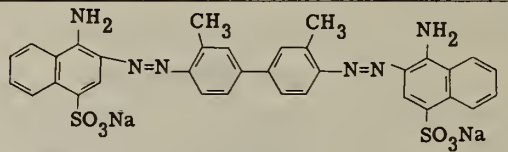
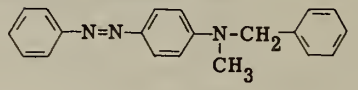
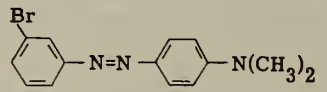
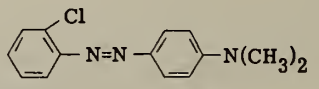
Reference	Animal	Strain or type	Sex	Preparation and dose	Site and route	Animals with tumors	Survival	Duration of experiment
583.--p-AMINOAZOTOLUENE 								
Crabtree, 1949	30 rats	52	M&F	0.06% in the diet	P.O.	0	----	595 d.
	40 mice	Simpson	M&F	0.06% in the diet	P.O.	0	----	595 d.
584.--2'-AMINO-2,5'-AZOTOLUENE 								
Crabtree, 1949	40 mice	Simpson	M&F	0.06% in the diet	P.O.	Tumors[151]	----	595 d.
	30 rats	52	M&F	0.06% in the diet	P.O.	Tumors[152]	----	595 d.
585.--4'-AMINO-3,2'-AZOTOLUENE 								
Crabtree, 1949	40 mice	52	M&F	0.06% in the diet	P.O.	1[153]	----	595 d.
	30 rats	52	M&F	0.06% in the diet	P.O.	0	----	595 d.
586.--4'-AMINO-4,2'-AZOTOLUENE 								
Crabtree, 1949	40 mice	Simpson	M&F	0.06% in the diet	P.O.	Tumors[154]	----	595 d.
	30 rats	52	M&F	0.06% in the diet	P.O.	0	----	595 d.
587.--4'-AMINO-4,3'-AZOTOLUENE 								
Crabtree, 1949	40 mice	Simpson	M&F	0.06% in the diet	P.O.	1[153]	----	595 d.
	30 rats	52	M&F	0.06% in the diet	P.O.	0	----	595 d.

[151] 9 hepatomas and cholangiomas.
[152] 3 hepatomas.
[153] Early hepatoma.
[154] 6 hepatomas and cholangiomas.

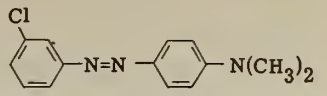
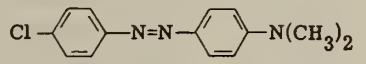
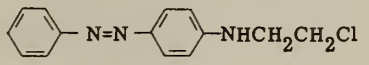
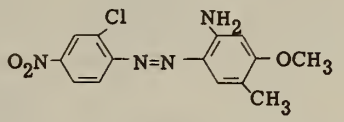
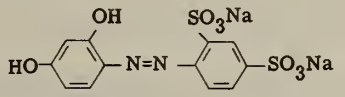
Reference	Animal	Strain or type	Sex	Preparation and dose	Site and route	Animals with tumors	Survival	Duration of experiment
588.--2'-AMINO-4'-HYDROXYBENZENE-AZO-2-FLUORENE 								
Ray et al., 1952	12 rats	Sprague-Dawley-Holtzman	----	0.1 mg. daily in amyl acetate, 36 times	Skin	0	12 alive at 6 mos.	At least 12 mos.
589.--ANILINE-AZO-2-NAPHTHYLAMINE 								
Druckrey and Schmahl (unpub. data)	107 rats	BD I, BD III White	----	10 mg. daily (total dose 8.9 g.)	P.O.	3[155]	61 alive after 1 yr.	32 mos.
590.--AZOBENZENE 								
Spitz et al., 1950	50 rats	Sherman	M&F	30 mg. in 1 cc. olive oil or butyl succinate once weekly (total 3.1 gm.)	S.C.	Tumors[156]	37 alive at 300 d.	600 d. avg.
Eldredge and Luck, 1952	4 rats	Sprague-Dawley	M	0.06% in the diet for 10 wks.	P.O.	0	----	10 wks.
591.--AZO-BIS-ISOBUTYRONITRILE $NCC(CH_3)_2N{=}NC(CH_3)_2CN$								
Boyland and Sargent, 1951	5 mice	B	----	0.03 molar in saline, 0.05 ml. in 20 sites	Intradermal	0	----	----
592.--AZOXYBENZENE 								
Spitz et al., 1950	66 rats	Sherman	M&F	40 mg. in 1 cc. olive oil or butyl succinate once weekly (total 4.2 gm.)	S.C.	0	37 alive at 300 d.	600 d. avg.
593.--BENZENE-AZO-BENZENE(-4-)AZO(1')-2'-ETHYLAMINONAPHTHALENE 								
Hackmann, 1951a	20 rats	Heterozygotic	----	0.1% in the diet	P.O.	0	5 alive at 2 yrs.	At least 2 yrs.

[155] Uterine carcinoma, carcinoma of the pancreas, and papilloma of the kidney after 17 to 20 months.

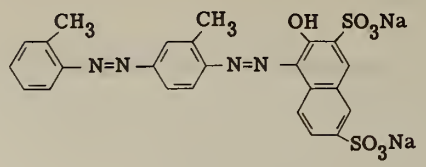
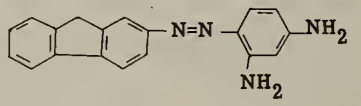
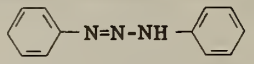
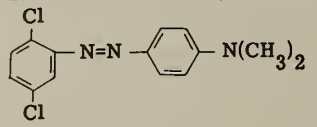
[156] 1 ear duct carcinoma.

Reference	Animal	Strain or type	Sex	Preparation and dose	Site and route	Animals with tumors	Survival	Duration of experiment
594.--BENZENE-AZO-BENZENE(-4-)AZO-3'-METHYL-4'-HYDROXYBENZENE 								
Hackmann, 1951a	20 rats	Heterozygotic	----	0.1% in the diet	P.O.	0	3 alive at 2 yrs.	At least 2 yrs.
595.--4-BENZENEAZO-1-PHENYL-3-METHYL-5-PYRAZOLONE 								
Hackman, 1951a	20 rats	Heterozygotic	----	0.1% in the diet	P.O.	0	2 alive at 2 yrs.	At least 2 yrs.
596.--BENZOPURPURIN 4 B 								
Marshall, 1953	23 rats	Wistar	M&F	1 cc. of a 2% aqueous soln. every 2 wks. for 7 mos.	I.P.	0	----	At least 7 mos.
597.--4-BENZYLMETHYLAMINOAZOBENZENE 								
Miller and Miller, 1948	12 rats	Sprague-Dawley	M	0.077% in the diet for 6 mos.	P.O.	0	----	9 mos.
598.--3'-BROMO-4-DIMETHYLAMINOAZOBENZENE 								
Kuhn and Quadbeck, 1949	12 rats	----	----	0.081% in the diet	P.O.	0	----	----
599.--2'-CHLORO-4-DIMETHYLAMINOAZOBENZENE 								
Miller and Miller, 1948	12 rats	Sprague-Dawley	M	0.068% in the diet for 4 mos.	P.O.	Tumors[157]	----	7 mos.

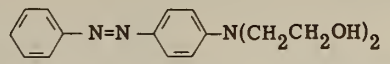
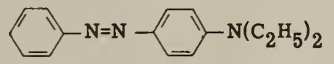
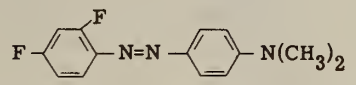
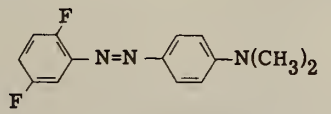
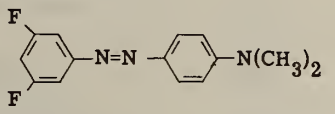
[157] 31% with hepatomas.

Reference	Animal	Strain or type	Sex	Preparation and dose	Site and route	Animals with tumors	Survival	Duration of experiment
600.--3'-CHLORO-4-DIMETHYLAMINOAZOBENZENE 								
Miller and Miller, 1948	12 rats	Sprague-Dawley	M	0.068% in the diet for 4 mos.	P.O.	Tumors[158]	----	7 mos.
Kuhn and Quadbeck, 1949	12 rats	----	----	0.064% in the diet	P.O.	0	----	----
601.--4'-CHLORO-4-DIMETHYLAMINOAZOBENZENE 								
Miller and Miller, 1948	12 rats	Sprague-Dawley	M	0.068% in the diet for 5 mos.	P.O.	Tumors[159]	----	7 mos.
602.--N-β-CHLOROETHYL-p-AMINOAZOBENZENE 								
Kensler (unpub. data)	15 rats	Wistar	M	0.07% in the diet	P.O.	0	14 alive	9 mos.
603.--2-CHLORO-4-NITROBENZENEAZO-2'-AMINO-4'-METHOXY-5'-METHYLBENZENE 								
Hackmann, 1951a	20 rats	Heterozygotic	----	0.1% in the diet	P.O.	2[160]	1 alive at 3 yrs.	At least 3 yrs.
604.--CHRYSOIN SGX 								
Druckrey, 1950b	110 rats	----	----	24 mg. daily in the diet (highest dose was 19 g.)	P.O.	0	----	900 d.

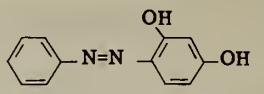
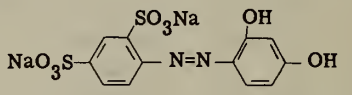
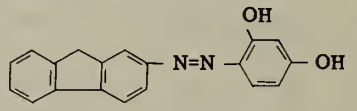
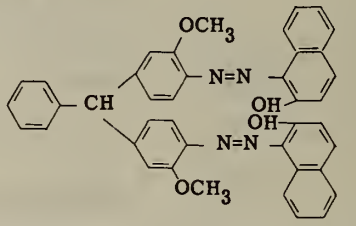
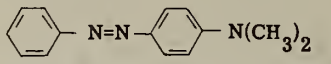
[158] 92% with hepatomas.
[159] 27% with hepatomas.
[160] Fibroadenomas of the breast.

Reference	Animal	Strain or type	Sex	Preparation and dose	Site and route	Animals with tumors	Survival	Duration of experiment
605. --CLOTH RED B 								
Stern, 1950a	34 mice	C57 black	----	0.5% twice weekly	S.C.	1 sarc.[161]	----	20 mos.
	28 mice	C3H	----	0.5% twice weekly	S.C.	1 sarc.[162]	----	20 mos.
	28 mice	C3H	----	0.1 - 1% aqueous soln. once or twice weekly	S.C.	1 sarc.[162]	----	Over 15 mos.
	34 mice	C57 black	----	----	S.C.	1 sarc.[161]	----	Over 16 mos.
606. --2',4'-DIAMINOBENZENE-AZO-2-FLUORENE 								
Ray et al., 1952	24 rats	Sprague-Dawley-Holtzman	----	0.1 mg. daily in amyl acetate, 36 times	Skin	0	23 alive at 6 mos.	At least 12 mos.
607. --DIAZOAMINOBENZENE 								
Kirby, 1947a	Mice	Stock	M&F	0.5-5.0% in acetone	Skin	2 epi.	----	601 d.
	32 mice	Stock	M&F	0.05 or 0.10% in diet[163]	P.O.	0	At least 4 alive at 240 d.	At least 240 d.
	Mice	Stock	M&F	4 - 10 mg. in arachis oil, 1-3 inj.	S.C.	0	4 alive at 323 d.	329 d.
Kirby, 1948c	11 mice	Mixed stock	----	5% in acetone, plus 0.5% croton oil for 15 days and then 5% in acetone only for 167 days and then croton oil again up to 545 d.	Skin	3 pap., 2 epi.	6 alive at 300 d.	545 d.
	19 mice	Mixed stock	----	5% in acetone, plus 0.5% croton oil for 15 days, and then 5% in acetone only 3 times weekly for 545 d.	Skin	3 pap., 4 epi.	12 alive at 300 d.	545 d.
608. --2',5'-DICHLORO-4-DIMETHYLAMINOAZOBENZENE 								
Miller et al., 1949	14 rats	Albino	M	2.67 m.mols per kg. in the diet for 8 mos.	P.O.	0	10 alive at 10 mos.	14 mos.

[161] At 16 mos.
[162] At 15 months.
[163] Two different diets used.

Reference	Animal	Strain or type	Sex	Preparation and dose	Site and route	Animals with tumors	Survival	Duration of experiment
609.--N,N-DIETHANOL-p-AMINOAZOBENZENE 								
Sugiura, 1948	10 rats	Sherman	M	0.076% in the diet for 162 to 313 d.	P.O.	0	----	313 d.
610.--p-DIETHYLAMINOAZOBENZENE 								
Kirby, 1947b	19 rats	Wistar	M&F	0.05 - 0.10% in diet for 635 d.	P.O.	0	12 alive at 400 d.	635 d.
	70 mice	Stock	M&F	1% or 3% in arachis oil, 0.25 or 0.5 cc.	S.C.	0	24 died in 1 wk.	622 d.
	64 mice	Cba	M&F	0.5-0.3% in arachis oil, 0.25 cc.	S.C.	0	----	More than 220 d.
Miller and Miller, 1948	12 rats	Sprague-Dawley	M	0.067% in the diet for 6 mos.	P.O.	0	----	0
Sugiura, 1948	20 rats	Sherman	M	0.067% in the diet for 123 or 313 d.	P.O.	0	----	313 d.
Sugiura et al., 1953	15 rats	----	----	----	P.O.	0	----	250 d.
611.--2',4'-DIFLUORO-4-DIMETHYLAMINOAZOBENZENE 								
Miller et al., 1953	16 rats	Holtzman	M	0.063% in the diet for 3 mos.	P.O.	16[164]	16 alive at 5 mos.	5 mos.
612.--2',5'-DIFLUORO-4-DIMETHYLAMINOAZOBENZENE 								
Miller et al., 1953	16 rats	Holtzman	M	0.063% in the diet for 3 mos.	P.O.	16[164]	16 alive at 5 mos.	5 mos.
613.--3',5'-DIFLUORO-4-DIMETHYLAMINOAZOBENZENE 								
Miller et al., 1953	16 rats	Holtzman	M	0.063% in the diet for 3 mos.	P.O.	14[164]	14 alive at 5 mos.	5 mos.

[164] Hepatomas.

Reference	Animal	Strain or type	Sex	Preparation and dose	Site and route	Animals with tumors	Survival	Duration of experiment
614. --2,4-DIHYDROXYAZOBENZENE 								
Druckrey and Schmahl (unpub. data)	89 rats	BD I, BD III White	----	9 mg. daily (total dose 7.5 g.)	P.O.	0	58 alive at 1 yr.	30 mos.
615. --2,4-DIHYDROXYAZOBENZENE-2',4'-DISULPHONIC ACID SODIUM SALT 								
Druckrey and Hamperl, 1950	108 rats	Hybrids	----	24 mg. daily (total dose 19 g.)	P.O.	0	80 alive at 1 yr.	32 mos.
616. --2',4'-DIHYDROXYBENZENE AZO-2-FLUORENE 								
Ray et al., 1952	Rats	Sprague-Dawley-Holtzman	----	0.1 mg. daily in amyl acetate 36 times	Skin	0	12 alive at 6 mos.	At least 12 mos.
617. --3,3'-DIMETHOXYTRIPHENYLMETHANE-4,4'-BIS(1''-AZO-2''-NAPHTHOL) 								
Hackmann, 1951a	20 rats	Heterozygotic	----	0.1% in the diet	P.O.	4[165]	1 alive at 3 yrs.	At least 3 yrs.
618. --p-DIMETHYLAMINOAZOBENZENE 								
Jaffé, 1947b	28 rats	Albino	----	0.015% in diet	P.O.	Tumors[166]	----	15 mos.
Jaffé, 1947d	22 mice	Albino	----	0.015% in diet	P.O.	Tumors[166a]	----	4 mos.
Kirby, 1947b	>15 rats	Wistar	M&F	0.06 - 0.1% in diet for at least 33 wks.	P.O.	Tumors[167]	----	More than 1 yr.

[165] Fibroadenomas of the inguinal region, right flank and breast.

[166] 17 hepatomas and 1 sarcoma.

[166a] 25% with pulmonary adenomas (control group with 5% in untreated animals) No other pathology discussed.

[167] Of the liver in 18 animals; hepatomas and bile duct carcinoma.

Reference	Animal	Strain or type	Sex	Preparation and dose	Site and route	Animals with tumors	Survival	Duration of experiment
618.--p-DIMETHYLAMINOAZOBENZENE--Continued								
Zamecnik and Stephenson, 1947	Rats	Sherman	M	0.06% in the diet	P.O.	Tumors[168]	----	At least 205 d.
Griffin and Baumann, 1948b	129 rats	----	----	0.06% in the diet for 3 to 5 mos.[169]	P.O.	45[164]	113 alive at 5 to 7 mos.	7 mos.
	Rats	Sprague-Dawley	----	0.06% in the diet	P.O.	0[170]	----	16 wks.
Jaffé, 1948	Rats	Albino	----	0.015% in the diet	P.O.	Tumors[171]	38 alive at 15 mos.	15 mos.
	Rats	Albino	----	0.015% in the diet; 0.4% sodium thiosulfate added to the diet	P.O.	Tumors[172]	40 alive at 15 mos.	15 mos.
Maisin and Beeckmans, 1948	Rats	----	----	----[173]	P.O.	28[174]	46 alive at 100 d.	At least 400 d.
Miller et al., 1948	18 rats	Sprague-Dawley	M	0.054% in the diet	P.O.	Tumors[174a]	----	16 wks.
	18 rats	Sprague-Dawley	M	0.06% in the diet for 25 wks.	P.O.	Tumors[175]	----	25 wks.
	36 rats	Sprague-Dawley	M	0.06% in the diet[176]	P.O.	Tumors[177]	Some sacrificed at intervals	19 wks.
	18 rats	Sprague-Dawley	M	0.06% in the diet for 25 wks., 0.03% dl-methionine added	P.O.	Tumors[178]	----	25 wks.
	18 rats	Sprague-Dawley	M	0.06% in the diet for 25 wks., 0.5% l-cystine added	P.O.	Tumors[179]	----	25 wks.
	9 rats	Sprague-Dawley	M	0.06% in the diet; detergent added	P.O.	0	----	19 wks.
	18 rats	Sprague-Dawley	M	0.06% in the diet[176]	P.O.	0	----	19 wks.
	20 rats	Sprague-Dawley	M	0.054% in the diet	P.O.	Tumors[174a]	----	22 wks.
	9 rats	Sprague-Dawley	M	0.06% in the diet, low fat diet	P.O.	Tumors[180]	----	19 wks.

[164] Hepatomas.
[168] Hepatomas, 3 with metastases; 1 bile duct carcinoma.
[169] Subdivided with various dietary supplements. Additional groups with no tumor incidence stated.
[170] Cirrhosis of the liver. Tumors not recorded.
[171] 10 liver tumors, 6 other tumors.
[172] 1 liver tumor, 2 other tumors.
[173] Diet: mashed potatoes plus fresh carrots, and barley plus fresh carrots.
[174] "Liver cancer".
[174a] No details.
[175] 75% with hepatomas.
[176] Various quantities of riboflavin added to diet.
[177] 50-100% with hepatomas.
[178] 50% with hepatomas.
[179] 13% with hepatomas.
[180] 20% with hepatomas.

Reference	Animal	Strain or type	Sex	Preparation and dose	Site and route	Animals with tumors	Survival	Duration of experiment
618.--p-DIMETHYLAMINOAZOBENZENE--Continued								
Miller et al., 1948	9 rats	Sprague-Dawley	M	0.06% in the diet; egg white added	P.O.	Tumors[181]	----	19 wks.
	9 rats	Sprague-Dawley	M	0.06% in the diet; hydrogenated cocoanut oil	P.O.	Tumors[182]	----	19 wks.
	9 rats	Sprague-Dawley	M	0.06% in the diet; high corn oil diet	P.O.	Tumors[183]	----	19 wks.
	9 rats	Sprague-Dawley	M	0.06% in the diet; rice-bran extract added	P.O.	Tumors[183]	----	19 wks.
Miller and Miller, 1948	36 rats	Sprague-Dawley	M	0.06% in the diet for 4 mos.	P.O.	Tumors[184]	----	At least 6 mos.
Silverstone, 1948a	72 rats	Sprague-Dawley	M	0.06% in the diet for 4 mos.; various diets of protein and fats	P.O.	37[185]	----	6 mos.
	48 rats	Sprague-Dawley	M	0.06% in the diet for 4 mos.; brown rice and yeast	P.O.	32[185]	----	6 mos.
Sugiura, 1948	15 rats	Sherman	M	0.06% in the diet for 95 to 240 d.	P.O.	Tumors[186]	----	250 d.
Cantero, 1949	Rats	Wistar	M&F	0.06% in the diet for 300 d. (total 470 mg. per rat)	P.O.	Tumors[187]	----	300 d.
Glinos and Bucher, 1949	60 rats[188]	Sprague-Dawley	M	0.06% in the diet for 110 d.	P.O.	31[189]	----	Over 260 d.
Griffin et al., 1949a	75 rats	----	----	0.06% in the diet for 19 or 20 wks.; 12 - 36% casein in the diet	P.O.	28[185]	68 alive at 19 wks.	At least 20 wks.
	72 rats	----	----	0.06% in the diet for 17 wks.; 6 - 12% casein plus 1 - 20 mg. riboflavin per kg. in the diet	P.O.	2[185]	44 alive at 17 wks.	At least 17 wks.
	30 rats	----	----	0.06% in the diet for 19 or 20 wks.; 12% casein plus 3.6 or 7.2 gm. methionine per kg. in the diet	P.O.	5[185]	29 alive at 19 wks.	At least 20 wks.
	15 rats	----	----	0.06% in the diet for 17 wks.; 12% casein, 1-2 mg. per kg. in the diet	P.O.	1[185]	13 alive at 17 wks.	17 wks.
Harris, 1949	Rzts	Evans, Sprague-Dawley, Harlan, Wistar, Carworth Farms	----	0.09% in the diet; various diets	P.O.	Tumors[190]	----	----

[181] 14% with hepatomas.
[182] 8% with hepatomas.
[183] 90-100% with hepatomas.
[184] 100% with hepatomas.
[185] Hepatomas.
[186] 93% with hepatomas; 4 with metastases.
[187] 89.3% with hepatomas and cholangiomas after 150 days.
[188] Some had partial hepatectomies.
[189] Hepatic carcinomas; cholangiomas.
[190] Various incidences, not stated.

Reference	Animal	Strain or type	Sex	Preparation and dose	Site and route	Animals with tumors	Survival	Duration of experiment
618.--p-DIMETHYLAMINOAZOBENZENE--Continued								
Harris and Clowes, 1949	14 rats	----	----	In the diet; 1% thiosalicylic acid also added	P.O.	Tumors[185]	----	400 d.
Hoch-Ligeti, 1949a	20 rats	Wistar	M&F	0.06% in the diet	P.O.	18[191]	----	20 mos.
	30 rats	Wistar	----	0.06% in the diet; plus 10 ml. milk per rat per d.	P.O.	3[192]	----	20 mos.
Hoch-Ligeti, 1949b	9 rats	Wistar	M&F	0.07% of a synthetic diet	P.O.	9[192a]	----	76 wks.
Hoch-Ligeti et al., 1949	42 rats	Black hooded	M&F	0.06% in the diet for 14 mos.	P.O.	Tumors[193]	----	14 mos.
Kirby, 1949	Rats	Wistar	----	0.06 or 0.07% in the diet; various percentages of casein and starch added.	P.O.	Tumors[194]	----	----
Lowenhaupt, 1949	14 rats	----	----	Pellets of approximately 20 mg. and 0.6 gm. per kg. in diet	Intrasplenic pellets and P.O.	Tumors[195]	----	461 d.
	14 rats	----	----	Pellets of approximately 20 mg.	Intrasplenic	Tumors[196]	----	461 d.
Miller et al., 1949	28 rats	Albino	M	2.40 or 2.67 m.mols per kg. in the diet for 5 wks. or 3 mos. 50% given 2.13 m.mols per kg. for 4 mos.	P.O.	17[193]	27 alive at 5 mos.	At least 10 mos.
	14 rats	Albino	M	0.060% in the diet for 4 mos. (2.67 m.mols per kg.)	P.O.	10[193]	13 alive at 6 mos.	6 mos.
Pearson and Morrione, 1949	Rats	Sherman	M	In the diet	P.O.	Tumors[197]	----	Over 4 mos.
Price et al., 1949	Rats	Sprague-Dawley	M	0.06% in the diet for 4 to 5 mos.	P.O.	Tumors[193]	----	5 mos.
Robertson and Kretchmer, 1949	Rats	Sherman	----	In the diet for 4 mos.	P.O.	Tumors	----	5 mos.
Schweigert et al., 1949	20 rats	Holtzman	M	0.06% in the diet for 5 mos.	P.O.	Tumors[193]	----	5 mos.
Stowell, 1949	50 rats	White and Piebald	----	0.06% in the diet	P.O.	Tumors[198]	----	27 wks.
Cantero, 1950	Rats	----	----	----	P.O.	Tumors[193]	----	30 d.
Cantero et al., 1950	Rats	Carworth Albino	----	0.06% in the diet for 150 d.	P.O.	0[197a]	----	150 d.
Day et al., 1950	9 rats	Sprague-Dawley	F	70 mg. per 100 gm. of diet	P.O.	1[193]	6 alive at 170 d.	170 d.
	27 rats	Sprague-Dawley	F	70 mg. per 100 gm. of diet[199]	P.O.	11[193]	23 alive at 170 d.	170 d.

[185] Hepatomas.
[191] 16 hepatomas, 1 pancreatic and 1 intestinal tumor.
[192] 1 liver tumor (hepatoma), 2 pancreatic tumors (carcino-sarcoma).
[192a] All with hepatomas, 1 with pituitary tumor resembling a hemangioma.
[193] Hepatomas.
[194] 33% with hepatomas at 1 year; 100% with hepatomas at 10 months.
[195] 2 cholangiomas and 2 splenic lymphosarcomas.
[196] 2 splenic lymphosarcomas.
[197] Hepatomas, cholangiomas and cystadenomas of the liver.
[197a] No pathological details. Precancerous cirrhosis discussed.
[198] 75% of those killed after 6 months had hepatomas, some cholangiomas, some malignant.
[199] Varied amounts of vitamins given in diet.

Reference	Animal	Strain or type	Sex	Preparation and dose	Site and route	Animals with tumors	Survival	Duration of experiment
618.--p-DIMETHYLAMINOAZOBENZENE--Continued								
Gray et al., 1950	Rats	----	----	0.06% in the diet	P.O.	Tumors[193]	----	----
Mark, 1950	Rats	White	----	0.06% in a rice-carrot diet for up to 6 mos.	P.O.	Tumors[200]	Animals sacrificed at intervals	6 mos.
Pearson et al., 1950	77 rats	Sherman	M	0.06% in the diet	P.O.	Tumors[201]	Sacrificed at intervals	5 mos.
Polettini, 1950	42 mice	White	----	Saturated soln. in vegetable oil; after 20 days 30 mice painted twice weekly on the injected area with croton oil, 5% in mineral oil	S.C.	0	----	8 mos.
Tung and Cohen, 1950	10 rats	Sprague-Dawley	----	0.06% in the diet	P.O.	Tumors[193]	----	Over 4 mos.
Westerfeld et al., 1950	117 rats	Sprague-Dawley	M	0.06% in the diet, various levels of casein	P.O.	Tumors[202]	Sacrificed at intervals	24 wks.
White et al., 1950	Rat	----	----	0.06% in the diet[203]	P.O.	Tumors[204]	----	622 d.
White and Hein, 1950	Rats	----	----	0.02 - 0.06% in the diet; 6% casein added	P.O.	Tumors[205]	----	----
Buckley et al., 1951	50 rats	Sherman	F	0.06% in the diet; choline deficient, and glycocyamine (2%) added	P.O.	13[193]	46 alive at 6 mos.	6 mos.
	50 rats	Sherman	F	0.06% in the diet; basal diet supplemented by 2 gm. per 100 gm. choline chloride	P.O.	26[193]	48 alive at 5 mos.	6 mos.
Corre et al., 1951	9 rats	Wistar	----	6 mg. per d.	P.O.	Tumors[206]	----	232 d.
Druckrey, 1951	306 rats	----	----	0.1 - 30 mg. daily	P.O.	----	----	Over 1500 d.
	339 rats	----	----	1-5 mg. (total dose 0.95 - 950 mg.)	P.O.	Tumors[206a]	----	95 - 700 d.
	45 rats	----	----	20-30 mg. daily (total dose 1.02 - 1.04 g.)	P.O.	Tumors	----	36 or 52 d.
Dyer, 1951	28 rats	Wistar	M&F	0.06% in the diet; various diets[207a]	P.O.	Tumors[207]	----	6 mos.
Fones and White, 1951	Rats	Osborne-Mendel	----	In the diet	P.O.	Tumors[193]	----	Over 5 mos.
Glinos et al., 1951	187 rats[208]	Harvard	M	0.06% in the diet for 30 - 135 d.	P.O.	58[209]	At least 71 alive at 1 yr.	At least 1 yr.
Miller and Baumann, 1951	30 rats	Albino	M	0.06% in the diet for 20 wks.	P.O.	13[209]	30 alive at 20 wks.	28 wks.
	15 rats	Albino	M	0.060% in the diet for 20 wks.; 2-thiouracil added	P.O.	10[209]	15 alive at 20 wks.	28 wks.

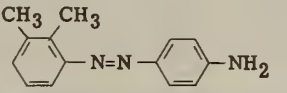
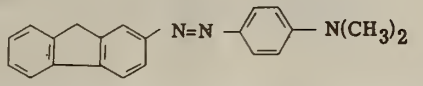
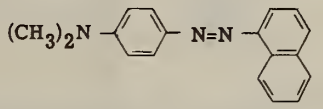
[193] Hepatomas.
[200] Hepatomas and cholangiomas, numbers not specified.
[201] 12 with tumors; biliary carcinoma, adenocarcinoma, cystadenocarcinoma, hepatoma.
[202] Biliary cystadenomas, bile duct carcinoma and hepatoma.
[203] Various percentages of fats and carbohydrates in diet.
[204] 50-94% with hepatomas.
[205] 54-99.2% with hepatomas.
[206] 3 adenomas of liver, 1 hepatoma.
[206a] No details.
[207] 7 hepatic carcinomas, several with hyperplastic nodules.
[207a] 14 choline deficient, 14 choline supplement.
[208] 50% of rats partially hepatectomized at 30-135 days.
[209] Hepatomas.

Reference	Animal	Strain or type	Sex	Preparation and dose	Site and route	Animals with tumors	Survival	Duration of experiment
618. --p-DIMETHYLAMINOAZOBENZENE--Continued								
Miller and Baumann, 1951	74 rats	Albino	M	0.06% in the diet for 20 wks.; high vitamin and 0.10% cystine added, plus iodinated casein added	P.O.	22[209]	39 alive at 20 wks.	28 wks.
Novikoff et al., 1951	Rats[210]	Sprague-Dawley	M	In the diet for 4 wks. - 4 mos.	P.O.	Tumors[209]	----	4 mos.
Price et al., 1951	Mice	Albino	F	0.045% in the diet for 4 mos.	P.O.	0	----	4 mos.
	Hamsters	Golden Syrian	M	0.06% in the diet for 4 mos.	P.O.	0	----	4 mos.
Steinberg and Spooner, 1951	31 rats	Albino	----	3% in the diet for 1 to 4 wks.	P.O.	5[211]	----	Approximately 18 mos.
Symeonidis et al., 1951	149 rats[209b]	Osborne-Mendel	M	In the diet for 190 d.	P.O.	9[209]	67 alive	190 d. 576 d.
Taki, 1951	Mice	----	----	0.06% in the diet for 30 d.	P.O.	0[209a]	Sacrificed at intervals	At least 10 wks.
	Rats	Albino	----	0.06% in the diet over 30 wks.	P.O.	0[209a]	Sacrificed at intervals	Over 30 wks.
White and Hein, 1951	99 rats	Osborne-Mendel	M&F	1.57 - 3.48 mg. daily intake in the diet (total intake 630 to 769 mg.); 0.5% L-cystine added	P.O.	Tumors[212]	----	At least 519 d.
	95 rats	Osborne-Mendel	M&F	1.02 - 1.97 mg. intake daily in the diet (total intake 310 to 377 mg.)	P.O.	Tumors[213]	----	At least 332 d.
Engel, R. W., 1952	10 rats	AES	M&F	0.045% in the diet for 4 mos.	P.O.	5[209]	----	----
	10 rats	Sprague-Dawley	M&F	0.045% in the diet for 4 mos.	P.O.	0	----	----
Firminger and Mulay, 1952	85 rats	Osborne-Mendel	M	0.06% in the diet for 150 to 280 d.	P.O.	57[209]	----	16 mos.
Harris and Clowes, 1952	1171 Rats	Harlan	M	0.06 or 0.09% in the diet	P.O.	672[214]	866 alive at time of first tumor	89 - 274 d.
	48 rats	Harlan	M	0.06% in the diet, plus 1% thiosalicylic acid	P.O.	8[215]	13 alive at time of first tumor	202 or 422 d.
Hecht, 1952	36 rats	----	M	0.01 or 0.05% in the diet (total dose 100 - 300 mg.)	P.O.	Tumors[216]	----	60 - 852 d.

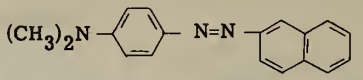
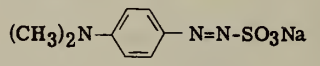
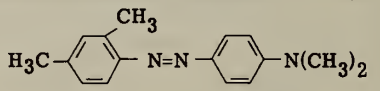
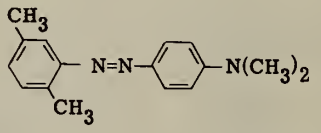
[209] Hepatomas.
[209a] No data.
[209b] 112 adrenalectomized.
[210] Some hepatectomized.
[211] "Cancer" or leukemia.
[212] 80-96% with hepatomas.
[213] 53-96% with hepatomas.
[214] Hepatomas, minimum latent period 89-274 days.
[215] Hepatomas, minimum latent period 202 or 422 days.
[216] 3 cystic tumors; also 12 cholangio-hepatomas.

Reference	Animal	Strain or type	Sex	Preparation and dose	Site and route	Animals with tumors	Survival	Duration of experiment
618. --p-DIMETHYLAMINOAZOBENZENE--Continued								
Hoffman and Schectman, 1952	131 rats	Long-Evans	F	0.06% in the diet for 5 to 16 wks.	P.O.	Tumors[209]	----	16 wks.
Kawai et al., 1952	Rats	Albino hybrid	----	0.06% in the diet	P.O.	Tumors[217]	59.6% died by the 30th day	Over 44 d.
Kishi and Haruno, 1952	8 rats	----	----	1 kg. of rice grains with 0.6 gms. of dye in 20 gm. of soy bean oil for 9 to 20 wks.	P.O.	1[209]	----	At least 20 wks.
	37 rats	----	----	1 kg. of rice grains with 0.6 gms. of dye in 20 gm. of soy bean oil for 9 to 20 wks., followed by 2 to 3 wks. on normal diet	P.O.	5[209]	----	At least 23 wks.
MacDonald et al., 1952	56 rats	Albino	M	0.030 or 0.060% in the diet	P.O.	27[209]	52 alive at 130 d.	190 d. - 210 d.
Mulay and Firminger, 1952a	Rats	Osborne-Mendel	M	0.06% in the diet for 150 or 280 d.	P.O.	Tumors[218]	Sacrificed at intervals	25 mos.
Mulay and Firminger, 1952b	85 rats	Osborne-Mendel	M	0.6% in the diet for 150 to 280 d.	P.O.	Tumors[219]	67 alive at 170 d.	21 mos.
Rumsfeld, Jr., et al., 1952	57 rats	----	M&F	0.06% in the diet for 16 to 20 wks.	P.O.	38[209]	54 alive at end of feeding	At least 30 wks.
Taki et al., 1952	50 rats	----	----	0.06% in the diet	P.O.	0[219a]	----	Over 11 wks.
Axelrod and Hofmann, 1953	20 rats	Sprague-Dawley	M	0.1% in diet ad lib.	P.O.	5[209]	17 alive at 12 mos.	At least 12 mos.
	40 rats	Sprague-Dawley	M	0.1% in diet ad lib., biotin and oxybiotin supplement	P.O.	12[209]	32 alive at 12 mos.	At least 12 mos.
Clement et al., 1953	Rats	----	----	0.6% in the diet, containing 5% of cholesterol (fatty livers)	P.O.	0	----	2 yrs.
De Lamirande et al., 1953	Rats	Wistar	----	0.06% in the diet	P.O.	Tumors[209]	Some killed at 30 d.	90 d.
Klamerth, 1953	Rats	----	----	300 gm. of fat containing 0.6% of the dye in the diet for at least 8 mos., plus additional amounts of dye in oil by pipette during first 5 mos. of the experiment	P.O.	0	----	At least 8 mos.
Miller et al., 1953	64 rats	Holtzman	M	0.054 to 0.06% in the diet for 3 or 4 mos.	P.O.	30[209]	62 alive at 5 mos.	5 mos. or 6 mos.
	16 rats	Holtzman	M	0.045 - 0.054% in the diet for 3 mos., 0.054% for one wk. only	P.O.	6[209]	15 alive at 5 mos.	5 mos.
	16 rats	Holtzman	M	0.002 - 0.06% for 4 mos., plus sodium fluoro-acetate; 0.06% for one wk. only	P.O.	7[209]	15 alive at 6 mos.	6 mos.

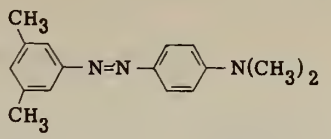
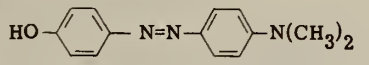
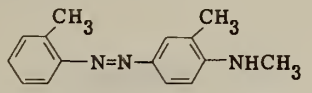
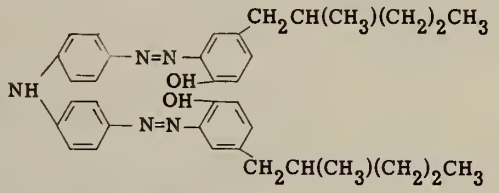
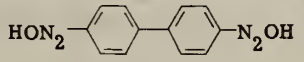
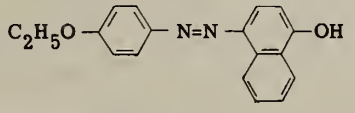
[209] Hepatomas.
[217] Tumors mentioned but details only refer to nodular hyperplasia.
[218] Hepatomas, cholangiomas and cholangio-hepatomas, beginning at 6 months.
[219] 21 hepatomas. First tumor at 111 days.
[219a] No full report, cirrhosis noted.

Reference	Animal	Strain or type	Sex	Preparation and dose	Site and route	Animals with tumors	Survival	Duration of experiment
618.--p-DIMETHYLAMINOAZOBENZENE--Continued								
Mori and Shimojo, 1953	14 rats	Albino	----	In the diet for 120 d. (dose not given)	P.O.	6[209]	----	150 d.
Nelson and Woodard, 1953	19 dogs	Irish terrier and Mongrel	M&F	5 or 20 mg. per kg. body wt. daily	P.O.	2[220]	8 alive at 16 mos.	57 mos. - 63 mos.
Pascaud and Louedec, 1953	Rats	Wistar	----	0.6% in the diet; plus rice and all vitamins	P.O.	Tumors[209]	----	6 mos.
Salaman and Roe, 1953	12 mice	Stock albino "S"	F	Acetone soln. 12 to 48 mg., 2 applications, followed by 0.5% croton oil in acetone weekly for 20 wks.	Skin	1 pap.	8 alive at 16 wks.	33 wks.
619.--2',3'-DIMETHYL-4-AMINOAZOBENZENE 								
Miller et al., 1949	14 rats	Albino	M	2.67 m.mols per kg. in the diet for 14 mos.	P.O.	0	9 alive at 14 mos.	14 mos.
620.--4'-DIMETHYLAMINOBENZENE-AZO-2-FLUORENE 								
Ray et al., 1952	12 rats	Sprague-Dawley-Holtzman	----	0.2 mg. daily in amyl acetate, 36 times	Skin	0	10 alive at 6 mos.	At least 12 mos.
621.--p-DIMETHYLAMINOBENZENEAZO-1-NAPHTHALENE 								
Mulay and Firminger, 1949	80 rats	Osborne-Mendel	----	0.075 gm. per 100 gm. diet for 8 mos.	P.O.	Tumors[221]	----	At least 8 mos.
Firminger and Mulay, 1952	80 rats	Osborne-Mendel	M	0.075% in the diet for 230 to 280 d.	P.O.	36[222]	----	24 mos.
Mulay and Firminger, 1952a	80 rats	Osborne-Mendel	M	0.075% in the diet for 230 to 280 d.	P.O.	Tumors[225]	Sacrificed at intervals	25 mos.
Mulay and Firminger, 1952b	80 rats	Osborne-Mendel	M	0.075% in the diet for 230 to 280 d.	P.O.	Tumors[223]	43 alive at 335 d.	24.5 mos.
Mulay and Firminger, 1952c	80 rats	Osborne-Mendel	M	0.075% in the diet for 230 to 280 d.	P.O.	Tumors[224]	Some sacrificed every 2 mos.	At least 550 d.

[209] Hepatomas.
[220] Papillomas of the bladder with invasion.
[221] 11 hepatomas.
[222] Hepatomas.
[223] 36 hepatomas, earliest at 11 months.
[224] 3 squamous cell carcinomas of the forestomach, 6 tumors of the fibrous stroma of the mammary gland, 1 sarcoma, 1 fibroadenoma (mammary). Numerous rats with hyperkeratosis of gastric mucosa. Liver lesions not discussed.
[225] Hepatomas, cholangiomas and cholangio-hepatomas, beginning at 11 months.

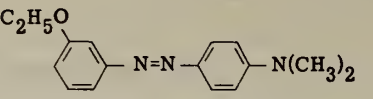
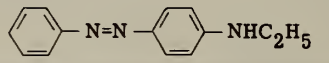
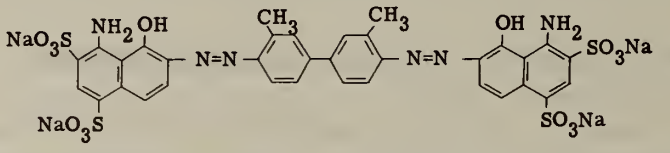
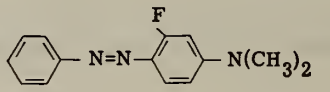
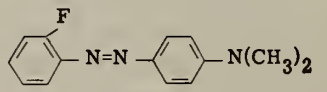
Reference	Animal	Strain or type	Sex	Preparation and dose	Site and route	Animals with tumors	Survival	Duration of experiment
622.--p-DIMETHYLAMINOBENZENE-1-AZO-2-NAPHTHALENE 								
Mulay and Saxen, 1952	25 mice	C57BR	M&F	1% soln. in benzene 3 times weekly for 39 wks. (total dose 120 mg.)	Skin	Tumors[226]	Some sacrificed early	14 mos.
	34 mice	C57BR	M&F	1% soln. in polyethylene glycol 3 times weekly for 39 wks. (total dose 120 mg.)	Skin	Tumors[227]	Several sacrificed early	14 mos.
Mulay and Congdon, 1953	51 rats	Osborne-Mendel	M&F	0.075% in the diet for 230 d.	P.O.	Tumors[228]	Sacrificed at intervals	At least 230 d.
	10 rats	Osborne-Mendel	M&F	1% in benzene, twice weekly for 18 mos.	Skin	0	----	18 mos.
623.--p-DIMETHYLAMINOBENZENEDIAZO SODIUM SULFONATE 								
Herrmann and DuBois, 1948	Rats	Sprague-Dawley	----	0.10% in the diet	P.O.	Tumors[229]	----	12 mos.
624.--2',4'-DIMETHYL-4-DIMETHYLAMINOAZOBENZENE 								
Miller and Miller, 1948	12 rats	Sprague-Dawley	M	0.067% in the diet for 7 mos.	P.O.	0	----	9 mos.
625.--2',5'-DIMETHYL-4-DIMETHYLAMINOAZOBENZENE 								
Miller and Miller, 1948	12 rats	Sprague-Dawley	M	0.067% in the diet for 7 mos.	P.O.	0	----	9 mos.

[226] 16 hemangioendotheliomas at site of painting, 4 hepatomas, 2 bile duct tumors.
[227] 32 hemangioendotheliomas at site of painting, 5 hepatomas.
[228] 74% with hepatomas, 12% with cholangio-carcinoma, 66% with cholangio-hepatoma, 10% undifferentiated, 62% with metastases of the lung. (1st tumor at 59 days.)
[229] Hepatomas in 12 months.

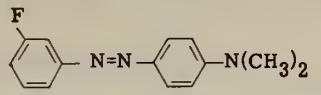
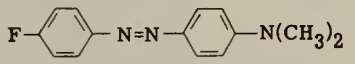
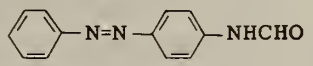
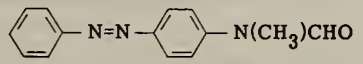
Reference	Animal	Strain or type	Sex	Preparation and dose	Site and route	Animals with tumors	Survival	Duration of experiment
626. --3',5'-DIMETHYL-4-DIMETHYLAMINOAZOBENZENE 								
Miller and Miller, 1948	12 rats	Sprague-Dawley	M	0.067% in the diet for 7 mos.	P.O.	0	----	9 mos.
627. --N, N-DIMETHYL-4'-HYDROXY-p-AMINOAZOBENZENE 								
Sugiura, 1947	Rats	----	----	0.06% in the diet	P.O.	0[230]	----	250 d.
Sugiura, 1948	16 rats	Sherman	M	0.064% in the diet for 87 to 250 d.	P.O.	0	----	250 d.
628. --2'3-DIMETHYL-4-MONOMETHYLAMINOAZOBENZENE 								
Miller et al., 1949	14 rats	Albino	M	2.67 m.mols per kg. in the diet for 14 mos.	P.O.	0	10 alive at 14 mos.	14 mos.
629. --DIPHENYLAMINE-4,4'-BIS(1''-AZO-2''-HYDROXY-5''-ISOHEXYLBENZENE) 								
Hackmann, 1951a	20 rats	Heterozygotic	----	13.12 g. for 1139 d., 0.1% in the diet	P.O.	0	15 alive over 1 yr.	At least 3 yrs.
630. --DIPHENYL-BIS(DIAZONIUM HYDROXIDE) 								
Boyland and Sargent, 1951	8 mice	Stock	----	0.01 molar in aqueous soln., 0.05 ml. in 32 sites	Intradermal	0	----	----
631. --4-ETHOXYBENZENE-1-(4'-AZO-1'-NAPHTHOL) 								
Hackmann, 1951a	20 rats	Heterozygotic	----	10.2 g. in 764 d., 0.1% in the diet	P.O.	0[231]	3 alive over 2 yrs.	At least 2 yrs.

[230] Of the liver.

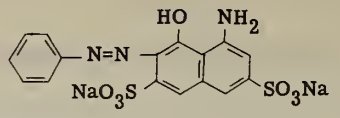
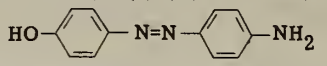
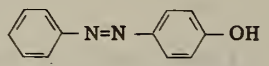
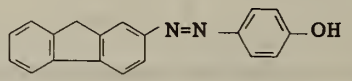
[231] Breast fibroadenoma. Probably spontaneous.

Reference	Animal	Strain or type	Sex	Preparation and dose	Site and route	Animals with tumors	Survival	Duration of experiment
632. --3'-ETHOXY-4-DIMETHYLAMINOAZOBENZENE 								
Miller and Miller, 1948	12 rats	Sprague-Dawley	M	0.072% in the diet for 7 mos.	P.O.	Tumors[232]	----	9 mos.
633. --N-ETHYL-p-AMINOAZOBENZENE 								
Miller and Miller, 1948	12 rats	Sprague-Dawley	M	0.060% in the diet for 6 mos.	P.O.	0	----	9 mos.
Sugiura et al., 1953	15 rats	----	----	----	P.O.	0	----	250 d.
634. --EVANS BLUE 								
Marshall, 1953	40 rats	Wistar	M&F	1 cc. of a 1% soln. every 2 wks. for 8 mos.	I.P.	Tumors[234]	----	340 d.
635. --2-FLUORO-4-DIMETHYLAMINOAZOBENZENE 								
Miller et al., 1953	16 rats	Holtzman	M	0.059% in the diet for 3 mos.	P.O.	13[235]	15 alive at 5 mos.	5 mos.
636. --2'-FLUORO-4-DIMETHYLAMINOAZOBENZENE 								
Miller et al., 1949	14 rats	Albino	M	2.40 m.mols per kg. in the diet for 3 mos.	P.O.	9[235]	14 alive at 5 mos.	10 mos.
Miller et al., 1953	16 rats	Holtzman	M	0.059% in the diet for 3 mos.	P.O.	8[235]	13 alive at 5 mos.	5 mos.

[232] 18% with hepatomas.
[234] 10 histiocytic tumors of the liver, 1 reticulum cell sarcoma.
[235] Hepatomas.

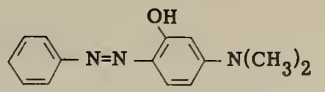
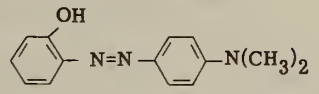
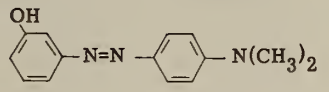
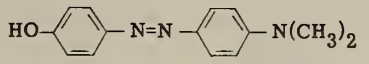
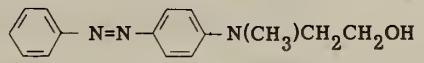
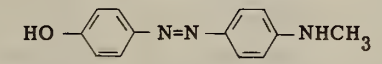
Reference	Animal	Strain or type	Sex	Preparation and dose	Site and route	Animals with tumors	Survival	Duration or experiment
637. --3'-FLUORO-4-DIMETHYLAMINOAZOBENZENE 								
Miller et al., 1949	14 rats	Albino	M	2.40 m.mols per kg. in the diet for 3 mos.	P.O.	12[235]	13 alive at 5 mos.	10 mos.
Miller et al., 1953	16 rats	Holtzman	M	0.059% in the diet for 3 mos.	P.O.	12[235]	14 alive at 5 mos.	5 mos.
638. --4'-FLUORO-4-DIMETHYLAMINOAZOBENZENE 								
Miller et al., 1949	28 rats	Albino	M	2.40 or 2.67 m.mols per kg. in the diet for 3 mos.	P.O.	24[235]	25 alive at 4 mos.	At least 4 mos.
Rumsfeld, Jr., et al., 1951	8 rats	Holtzman	M	0.040 in the diet for 14 wks., basal diet for 16 wks.	P.O.	Tumors[236]	8 alive at 14 wks.	30 wks.
	8 rats	Holtzman	F	Same as above.	P.O.	0	8 alive at 14 wks.	30 wks.
	12 rats	Holtzman	M	0.064 in the diet for 3 wks., basal diet 4 wks., 0.064 for 5 wks., basal diet 16 wks.	P.O.	Tumors [237]	12 alive at 13 wks.	29 wks.
	12 rats	Holtzman	F	Same as above.	P.O.	0	12 alive at 13 wks.	29 wks.
Price et al., 1952	Rats	Holtzman	M	0.058% in the diet	P.O.	Tumors[238]	Sacrificed at various intervals	133 d.
Price and Harman, 1952	Rats	----	----	0.058% in the diet	P.O.	Tumors[235]	----	Over 7 wks.
Miller et al., 1953	25 rats	Holtzman	M	0.059% in the diet for 3 mos.	P.O.	24[235]	25 alive at 5 mos.	5 mos.
639. --4-FORMYLAMINOAZOBENZENE 								
Miller and Miller, 1948	12 rats	Sprague-Dawley	M	0.060% in the diet for 6 mos.	P.O.	0	----	9 mos.
640. --4-FORMYLMONOMETHYLAMINOAZOBENZENE 								
Miller et al., 1949	14 rats	Albino	M	2.67 m.mols per kg. in the diet for 5 mos.	P.O.	4[235]	11 alive at 10 mos.	12 mos.

[235] Hepatomas.
[236] 50% with hepatomas.
[237] 8% with hepatomas.
[238] 16 hepatomas, 6 cholangiomas, 9 mixed hepatoma-cholangiomas.

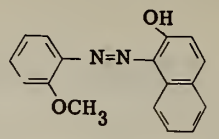
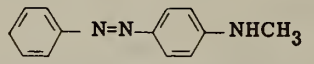
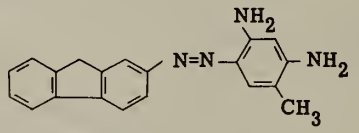
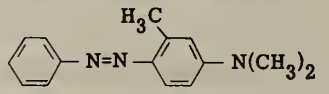
Reference	Animal	Strain or type	Sex	Preparation and dose	Site and route	Animals with tumors	Survival	Duration of experiment
641. --HEXACOL SUPRA-RED 10B[239] 								
Miller (Unpub. data)	Mice	GFF	M&F	0.5 cc. 2.5% suspension in arachis oil per mouse (12.5 mg. dye per mouse per injection, up to 33 injections)	S.C.	0	Majority dead at 18 mos.	Still in progress
	Mice	GFF	M&F	5.0% aqueous soln. on bread, 100 mg. dye per mouse daily 6 d. per wk.	P.O.	0	Majority dead at 18 mos.	Still in progress
	Mice	GFF	M&F	1.0% soln. in 90% ethyl alcohol, 3 times weekly, 2 strokes	Skin	0	Majority dead at 18 mos.	Still in progress
	12 rats	Scott Hooded	M&F	Feeding and drinking on alternate wks. 1.25% aqueous in water, ad lib. or 200 mg. per rat in the diet, 6 d. per wk.	P.O.	0	Majority dead at 18 mos.	Still in progress
	Mice	GFF	M&F	1.25% aqueous in water, ad lib.	P.O.	0	Majority dead at 18 mos.	Still in progress
642. --HYDRAZOBENZENE								
Spitz et al., 1950	52 rats	Sherman	M&F	60 mg. in 1 cc. olive oil or butyl succinate once weekly (total 6.4 gm.)	S.C.	Tumors[240]	31 alive at 300 d.	600 d. average
643. --4'-HYDROXY-4-AMINOAZOBENZENE 								
Miller and Miller, 1948	12 rats	Sprague-Dawley	M	0.057% in the diet for 6 mos.	P.O.	0	----	9 mos.
644. --4-HYDROXYAZOBENZENE 								
Miller and Miller, 1948	12 rats	Sprague-Dawley	M	0.053% in the diet for 6 mos.	P.O.	0	----	9 mos.
Lacassagne et al., 1952	10 rats	----	----	0.06% in the diet	P.O.	0	Alive at 300 d.	326 d.
645. --4'-HYDROXYBENZENE-AZO-2-FLUORENE 								
Ray et al., 1952	12 rats	Sprague-Dawley-Holtzman	----	0.2 mg. daily in amyl acetate, 36 times	Skin	0	12 alive at 6 mos.	At least 12 mos.

[239] Color Index No. 30.

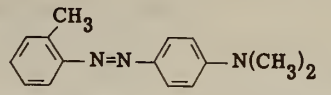
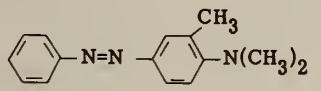
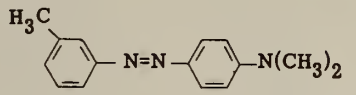
[240] 1 ear duct carcinoma.

Reference	Animal	Strain or type	Sex	Preparation and dose	Site and route	Animals with tumors	Survival	Duration of experiment
646. --2-HYDROXY-4-DIMETHYLAMINOAZOBENZENE 								
Miller et al., 1949	14 rats	Albino	M	2.67 m.mols per kg. in the diet for 8 mos.	P.O.	0	14 alive at 10 mos.	10 mos.
Schmahl, 1954	24 rats	BDIII	----	10 mg. daily (total dose: 2.5 g.)	P.O.	0	All dead at 1 yr.	10 mos.
647. --2'-HYDROXY-4-DIMETHYLAMINOAZOBENZENE 								
Miller and Miller, 1948	12 rats	Sprague-Dawley	M	0.064% in the diet for 6 mos.	P.O.	0	----	9 mos.
648. --3'-HYDROXY-4-DIMETHYLAMINOAZOBENZENE 								
Miller and Miller, 1948	12 rats	Sprague-Dawley	M	0.064% in the diet for 6 mos.	P.O.	0	----	9 mos.
649. --4'-HYDROXY-4-DIMETHYLAMINOAZOBENZENE 								
Miller and Miller, 1948	12 rats	Sprague Dawley	M	0.064% in the diet for 6 mos.	P.O.	0	----	9 mos.
650. --4-β--HYDROXYETHYLMETHYLAMINOAZOBENZENE 								
Miller and Miller, 1948	12 rats	Sprague-Dawley	M	0.068% in the diet for 6 mos.	P.O.	0	----	9 mos.
651. --4'-HYDROXY-4-MONOMETHYLAMINOAZOBENZENE 								
Miller and Miller, 1948	12 rats	Sprague-Dawley	M	0.061% in the diet for 6 mos.	P.O.	0	----	9 mos.

JANUS GREEN -- See under Heterocyclic Compounds

Reference	Animal	Strain or type	Sex	Preparation and dose	Site and route	Animals with tumors	Survival	Duration of experiment
652. --2'-METHOXYBENZENE-AZO-2-NAPHTOL 								
Druckrey and Schmahl (unpub. data)	147 rats	BD I, BD III, White	----	8 or 20 mg. daily (total dose 0.5 or 6.0 g.)	P.O.	0	67 alive after 1 yr.	28 mos.
653. --N-METHYL-p-AMINOAZOBENZENE 								
Kirby, 1947b	16 rats	Wistar	M&F	0.10 - 0.15% in the diet for 18 mos.	P.O.	0[241]	15 alive at 1 yr.	18 mos.
Miller and Miller, 1948	24 rats	Sprague-Dawley	M	0.056% in the diet for 4 mos.	P.O.	Tumors[242]	----	6 mos.
Sugiura, 1948	14 rats	Sherman	M	0.056% in the diet for 132 to 250 d.	P.O.	Tumors[243]	----	250 d.
Sugiura et al., 1953	15 rats	----	----	----	P.O.	Tumors[244]	----	250 d.
654. --5'-METHYL-2',4'-DIAMINOBENZENE-AZO-2-FLUORENE 								
Ray et al., 1952	12 rats	Sprague-Dawley-Holtzman	----	0.1 mg. daily in amyl acetate, 36 times	Skin	1 pap.[245]	12 alive at 6 mos.	At least 12 mos.
655. --2-METHYL-4-DIMETHYLAMINOAZOBENZENE 								
Miller et al., 1948	7 rats	Sprague-Dawley	M	0.058% in the diet	P.O.	0	----	16 wks.
Sorof et al., 1951	6 rats	Sprague-Dawley	M	0.058% in the diet for 11, 14 or 16 wks.	P.O.	0	----	16 wks.
Kensler et al., 1953	Rats	Wistar	----	0.064% in the diet	P.O.	0	----	8 wks.

[241] 1 ovarian sarcoma, assumed to be spontaneous; bile duct proliferation.
[242] 100% with hepatomas.
[243] 93% with hepatomas, 5 with metastases.
[244] 93% with hepatomas.
[245] Of the forestomach.

Reference	Animal	Strain or type	Sex	Preparation and dose	Site and route	Animals with tumors	Survival	Duration of experiment
656. --2'METHYL-4-DIMETHYLAMINOAZOBENZENE 								
Miller et al., 1948	7 rats	Sprague-Dawley	M	0.058% in the diet	P.O.	Tumors[246]	----	16 wks.
Griffin et al., 1949a	15 rats	----	----	0.096% in the diet for 19 wks., 24% casein in the diet	P.O.	7[247]	14 alive at 19 wks.	At least 19 wks.
	15 rats	----	----	0.096% in the diet for 19 wks., 12% casein in the diet	P.O.	11[247]	14 alive at 19 wks.	At least 19 wks.
	15 rats	----	----	0.096% in the diet for 19 wks., 12% casein, plus 3.6 gm. methionine per kg. in the diet	P.O.	4[247]	13 alive at 19 wks.	At least 19 wks.
657. --3-METHYL-4-DIMETHYLAMINOAZOBENZENE 								
Miller and Miller, 1948	6 rats	Sprague-Dawley	M	0.064% in the diet for 7 mos.	P.O.	0	----	9 mos.
658. --3'-METHYL-4-DIMETHYLAMINOAZOBENZENE 								
Griffin and Baumann, 1948a	14 rats	Sprague-Dawley	----	0.064% in the diet	P.O.	0[248]	----	At least 10 wks.
Griffin and Baumann, 1948b	20 rats	----	----	0.032% in the diet for 3 mos.	P.O.	9[247]	18 alive at 5 mos.	5 mos.
Miller et al., 1948	38 rats	Sprague-Dawley	M	0.054 or 0.058% in the diet	P.O.	Tumors[247a]	----	16 wks. or 22 wks.
Miller and Miller, 1948	24 rats	Sprague-Dawley	M	0.060 or 0.064% in the diet for 3 mos.	P.O.	Tumors[249]	----	4 mos.
Clayton and Baumann, 1949a	30 rats	----	M&F	0.048% for 6 wks., basal diet 4 or 10 wks., 0.048% for 4 wks.	P.O.	Tumors[250]	24 alive at 14 wks.	29 wks.
	171 rats	----	M&F	0.064% for 4 wks., basal diet 2 - 12 wks., 0.048 or 0.064% for 4 wks.	P.O.	Tumors[251]	130 alive at 8 wks.	20 or 29 wks.
	48 rats	----	M&F	0.064% for 4 wks., 0.29% nicotinamide 4 wks.; 0.048 or 0.064% for 4 wks.	P.O.	Tumors[252]	33 alive at 12 wks.	20 wks.

[246] No details except said to be weakly active.
[247] Hepatomas.
[247a] No details.
[248] Precancerous cirrhosis. Tumors not mentioned.
[249] 88 or 92% with hepatomas.
[250] 58 or 61% with hepatomas.
[251] 33-90% with hepatomas.
[252] 64-91% with hepatomas.

Reference	Animal	Strain or type	Sex	Preparation and dose	Site and route	Animals with tumors	Survival	Duration of experiment
658.--3'-METHYL-4-DIMETHYLAMINOAZOBENZENE--Continued								
Clayton and Baumann, 1949a	17 rats	----	M&F	0.064% for 4 wks., 0.29% nicotinamide for 4 wks.	P.O.	0	17 alive at 12 wks.	16 wks.
	30 rats	----	M&F	0.064% for 4 wks., basal restriction (63%) 4 wks., 0.048% for 4 wks.	P.O.	Tumors[253]	23 alive at 12 wks.	20 wks.
	30 rats	----	M&F	0.064% for 4 wks., 0.72% methionine 4 wks., 0.048 or 0.064% for 4 wks.	P.O.	Tumors[254]	27 alive at 12 wks.	20 wks.
	66 rats	----	M&F	0.048 or 0.064% in the diet for 4 - 10 wks.	P.O.	Tumors[255]	60 alive at 4 wks.	29 wks.
	30 rats	----	M&F	0.064% for 4 wks., 5 ppm. selenium 4 wks., 0.048% for 4 wks.	P.O.	Tumors[256]	22 alive at 12 wks.	20 wks.
	45 rats	----	M&F	0.064% for 4 wks., 24% casein 20 mg. riboflavin per kg. 4 wks., 0.048 or 0.064% for 4 wks.	P.O.	Tumors[257]	41 alive at 12 wks.	20 wks.
	15 rats	----	M&F	0.064% for 4 wks., 20% corn oil 4 wks., 0.048% for 4 wks.	P.O.	Tumors[255]	15 alive at 12 wks.	20 wks.
	15 rats	----	M&F	0.064% for 4 wks., 0.1% choline 4 wks., 0.048% for 4 wks.	P.O.	Tumors[258]	12 alive at 12 wks.	20 wks.
Clayton and Baumann, 1949b	Rats	----	----	8 wks. in the diet with intervals of normal diet	P.O.	Tumors[259]	----	Over 3 mos.
Griffin et al., 1949a	29 rats	----	----	0.04% in the diet for 14 or 18 wks.; 24% casein in the diet	P.O.	16[259]	28 alive at 14 wks.	At least 14 wks.
	29 rats	----	----	0.04% in the diet for 14 or 18 wks.; 12% casein in the diet	P.O.	27[259]	29 alive at 14 wks.	At least 14 wks.
	14 rats	----	----	0.04% in the diet for 18 wks.; 24% casein, 20 mg. riboflavin in the diet	P.O.	1[259]	14 alive at 18 wks.	18 wks.
	15 rats	----	----	0.04% in the diet for 14 wks.; 12% casein plus 3.6 gm. methionine per kg. in the diet	P.O.	10[259]	15 alive at 14 wks.	14 wks.
Kuhn and Quadbeck, 1949	12 rats	----	----	0.064% in the diet	P.O.	5	----	----
Cunningham et al., 1950	Rats	Sprague-Dawley	M&F	0.06% in the diet for 12 wks.	P.O.	Tumors[259]	Sacrificed at various intervals	12 wks.
	Rats	Sprague-Dawley	M&F	----	P.O.	([259])	All alive after 12 wks.	At least 12 wks.

[253] 67 or 93% with hepatomas.
[254] 53 or 67% with hepatomas.
[255] 100% with hepatomas.
[256] 22 or 31% with hepatomas.
[257] 20-77% with hepatomas.
[258] 75% with hepatomas.
[259] Hepatomas.

Reference	Animal	Strain or type	Sex	Preparation and dose	Site and route	Animals with tumors	Survival	Duration of experiment
658. --3'-METHYL-4-DIMETHYLAMINOAZOBENZENE--Continued								
Ely and Ross, 1950	25 rats	----	----	0.06% in the diet; casein basal diet	P.O.	0[259a]	3 alive at 94 d.	94 d.
	Rats	----	----	0.06% in the diet for 94 d.; pulverized "Wayne Fox Food Blox"	P.O.	Tumors[259]	100% alive	222 d.
Griffin et al., 1951b	23 rats	Holtzman, Sprague-Dawley	M	0.06% in the diet for 10 or 12 wks.	P.O.	20[259]	At least 12 alive at 16 wks.	16 wks.
Griffin et al., 1951c	Rats	Holtzman, Sprague-Dawley	M	0.06% in the diet for 10 wks.	P.O.	Tumors[259]	----	10 wks.
Griffin and Rhein, 1951	Rats	Albino	M	0.06% in the diet, 6 - 12 wks.	P.O.	Tumors[259]	Sacrificed at intervals	Over 12 wks.
Miller and Baumann, 1951	30 rats	Albino	M	0.064% in the diet for 8 wks. with an interval; basal diet	P.O.	7[259]	28 alive at 12 wks.	20 wks.
	30 rats	Albino	M	0.64% in the diet for 8 wks. with an interval; iodinated casein added	P.O.	12[259]	24 alive at 12 wks.	20 wks.
	30 rats	Albino	M	0.064% in the diet for 8 wks. with an interval; propylthiouracil added	P.O.	6[259]	29 alive at 12 wks.	20 wks.
	30 rats	Albino	M	0.064% in the diet for 8 wks. with an interval; iodinated casein plus propylthiouracil added	P.O.	7[259]	25 alive at 12 wks.	20 wks.
Novikoff et al., 1951	Rats[260]	Sprague-Dawley	M	In the diet for 4 wks.	P.O.	Tumors[259]	----	4 mos.
Pedrero and Kozelka, 1951	60 rats	Sprague-Dawley	M	0.059% in the diet	P.O.	48[259]	44 alive at 180 d.	180 d.
	10 rats	Sprague-Dawley	M	0.059% in the diet	P.O.	0	All died by 100 d.	100 d.
	10 rats	Sprague-Dawley	M	0.059% in the diet; plus 0.5% copper	P.O.	0	All died by 100 d.	100 d.
	40 rats	Sprague-Dawley	M	0.059% in the diet; plus 0.25% copper	P.O.	24[259]	30 alive by 180 d.	180 d.
Richardson and Borsos-Nachtnebel, 1951	26 rats	Sprague-Dawley	M&F	0.06% in the diet for 20 to 23 wks.	P.O.	Tumors[261]	----	23 wks.
	12 rats	Sprague-Dawley	M&F	0.06% in the diet for 15 to 19 wks.	P.O.	Tumors[262]	----	19 wks.
	16 rats	Sprague-Dawley	M&F	0.06% in the diet for 24 to 29 wks.	P.O.	Tumors[263]	----	29 wks.

[259] Hepatomas.
[259a] This point is not clear in this paper.
[260] Some hepatectomized.
[261] 26 hepatomas, 96% with metastases.
[262] 12 hepatomas, 75% with metastases.
[263] 16 hepatomas, 81% with metastases.

Reference	Animal	Strain or type	Sex	Preparation and dose	Site and route	Animals with tumors	Survival	Duration of experiment
658.--3'-METHYL-4-DIMETHYLAMINOAZOBENZENE--Continued								
Rumsfeld, Jr., et al., 1951	36 rats	Holtzman	M&F	0.064 in the diet for 4 wks., basal diet 4 wks., 0.064 for 5 wks., basal diet for 16 wks.	P.O.	Tumors[259]	26 alive at 13 wks.	29 wks.
	30 rats	Holtzman	M&F	0.040 in the diet for 12 wks., basal diet for 16 wks.	P.O.	Tumors[259]	30 alive at 12 wks.	28 wks.
	20 rats	Holtzman	M&F	0.064 in the diet for 4 wks., basal diet 4 wks., 0.064 for 4 wks., basal diet 16 wks.	P.O.	Tumors[259]	16 alive at 12 wks.	28 wks.
	30 rats	Holtzman	M&F	0.040 in the diet for 14 wks., basal diet for 16 wks.	P.O.	Tumors[259]	30 alive at 14 wks.	30 wks.
	30 rats	Holtzman	M, castr.	0.064 in the diet for 4 wks., basal diet 4 wks., 0.064 for 4 wks., basal diet for 16 wks.	P.O.	Tumors[259]	24 alive at 12 wks.	28 wks.
	30 rats	Holtzman	F, castr.	0.064 in the diet for 4 wks., basal diet 4 wks., 0.064 for 4 wks., basal diet for 16 wks.	P.O.	Tumors[259]	19 alive at 12 wks.	28 wks.
	12 rats	Holtzman	F	0.064 in the diet for 4 wks., basal diet 4 wks., 0.064 for 5 wks., basal diet 16 wks.	P.O.	Tumors[259]	10 alive at 13 wks.	29 wks.
Swick and Baumann, 1951	41 rats	Holtzman, Sprague-Dawley	M	0.040 - 0.064% in the diet for 7 - 12 wks., 1 or 1.6 mg. per kg. α-tocopherol, plus 5% corn oil	P.O.	17[259]	36 alive at 7 wks.	23 wks. or 28 wks.
	37 rats	Holtzman, Sprague-Dawley	M	0.064% in the diet 4 wks., per 4 wk. interval; plus 5% corn oil and 1 or 1.3 mg. per kg. α-tocopherol; diet again 4 to 5 wks.	P.O.	25[259]	37 alive at 13 wks.	21 wks.
	28 rats	Holtzman, Sprague-Dawley	M	0.040 or 0.064% in the diet for 7 or 12 wks., plus 4% lard plus 1% corn oil added	P.O.	9[259]	27 alive at 7 wks.	At least 23 wks.
	15 rats	Holtzman, Sprague-Dawley	M	0.064% in the diet 4 wks., per 4 wk. interval; 4% lard plus 1% corn oil during interval; diet again 4 to 5 wks.	P.O.	10[259]	15 alive at 13 wks.	21 wks.
	52 rats	Holtzman, Sprague-Dawley	M	0.040 - 0.064% in the diet for 7 - 12 wks.; 5% corn oil added	P.O.	29[259]	68 alive at 7 wks.	23 wks. or 28 wks.
	17 rats	Holtzman, Sprague-Dawley	M	0.064% in the diet 4 wks. per 4 wk. interval; 5% corn oil during interval; diet again 4 to 5 wks.	P.O.	8[259]	17 alive at 13 wks.	21 wks.
	30 rats	Holtzman, Sprague-Dawley	M	0.064% in the diet 4 wks., per 4 wk. interval; 5% linseed oil and 5% cod liver oil during interval	P.O.	15[259]	24 alive at 13 wks.	21 wks.
	30 rats	Holtzman, Sprague-Dawley	M	0.064% in the diet 4 wks., 4 wk. interval; 18% brewer's yeast during interval; diet again 4 to 5 wks.	P.O.	23[259]	29 alive at 13 wks.	21 wks.
	15 rats	Holtzman, Sprague-Dawley	M	0.064% in the diet 4 wks., 4 wk. interval; 18% brewer's yeast plus 0.33 mg. per kg. α-tocopherol; diet again 4 to 5 wks.	P.O.	13[259]	14 alive at 13 wks.	21 wks.

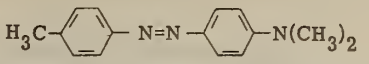
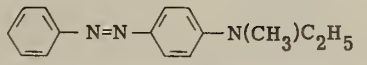
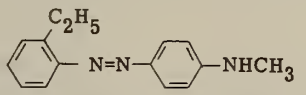
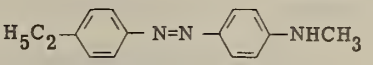
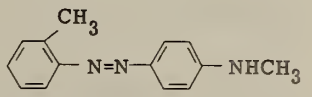
[259] Hepatomas.

Reference	Animal	Strain or type	Sex	Preparation and dose	Site and route	Animals with tumors	Survival	Duration of experiment
658.--3'-METHYL-4-DIMETHYLAMINOAZOBENZENE--Continued								
Williams et al., 1951	38 rats	Sprague-Dawley	----	0.04% in the diet for 24 wks.	P.O.	9[259]	9 alive at 6 mos.	At least 6 mos.
Woodward, 1951	Rats	Wistar	M	0.06% in the diet	P.O.	Tumors[259]	----	147 d.
Bertrand et al., 1951	20 rats	Wistar	----	1.04 g. per 3 kg. of food; synthetic diet	P.O.	20[267]	----	7 mos.
Eldredge and Luck, 1952	Rats	Sprague-Dawley	M	0.06% in the diet up to 12 wks.	P.O.	Tumors[259]	----	Over 12 wks.
Griffin et al., 1952	7 rats	Holtzman, Sprague-Dawley	M	0.06% in the diet for 12 wks.	P.O.	Tumors[259]	----	17 wks.
	Rats	Holtzman, Sprague-Dawley	M	0.06% in the diet for 7 wks.	P.O.	0[265]	----	7 wks.
Lacassagne et al., 1952	9 rats	----	----	0.06% in the diet	P.O.	0[266]	----	293 d.
MacDonald et al., 1952	12 rats	Albino	M	0.064% in the diet	P.O.	0	12 alive at 120 d.	190 d.
	16 rats	Albino	M	0.020% in the diet for 180 d.	P.O.	0	16 alive at 180 d.	270 d.
	36 rats	Albino	M	0.020 or 0.040% in the diet for 90 d.	P.O.	2[259]	35 alive at 130 d.	220 d. or 270 d.
Nordmann et al., 1952	20 rats	Wistar	----	1.04 g. per 3 kg. of food; synthetic diet	P.O.	20[267]	----	7 mos.
Price et al., 1952	Rats	Holtzman	M	0.058% in the diet	P.O.	Tumors[268]	Sacrificed at intervals	133 d.
Price and Harman, 1952	Rats	----	----	0.058% in the diet	P.O.	Tumors[259]	----	Over 7 wks.
Pryor et al., 1952	Rats	Sprague-Dawley	----	0.04% and 0.06% in the diet	P.O.	0[274a]	----	20 wks.
Richardson et al., 1952	54 rats	Sprague-Dawley	M&F	0.06% in the diet for 15 to 29 wks.	P.O.	Tumors[269]	----	29 wks.
Rumsfeld, Jr., et al., 1952	53 rats	----	M&F	0.064% in the diet for 4 wks., interval of 4 wks. then again for 4 wks.	P.O.	Tumors[270]	52 alive at end of feeding.	24 wks.
Salzberg and Griffin, 1952	14 rats	White	----	0.06% in the diet for 3 mos.	P.O.	Tumors[271]	----	Over 3 mos.
Ward et al., 1952	Rats	Holtzman, Sprague-Dawley	M	0.06% in the diet	P.O.	0	----	7 wks.

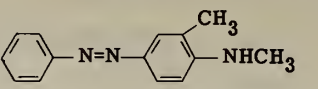
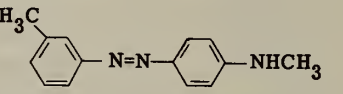
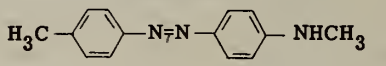
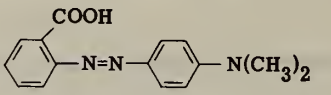
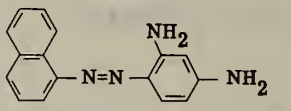
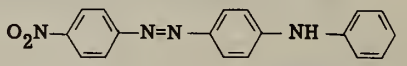
[259] Hepatomas.
[265] "Precancerous" changes.
[266] 7 with cholangiectasis.
[267] Hepatomas, cholangiomas, biliary cystoadenomas, pulmonary metastases.
[268] 25 hepatomas, 19 cholangiomas, 12 mixed hepatoma-cholangioma.
[269] 98% with hepatomas, 50% with metastases.
[270] 8 hepatomas.
[271] 90-100% with hepatomas.
[274a] This aspect not mentioned in this abstract.

Reference	Animal	Strain or type	Sex	Preparation and dose	Site and route	Animals with tumors	Survival	Duration of experiment
658. --3'-METHYL-4-DIMETHYLAMINOAZOBENZENE--Continued								
Delfel and Griffin, 1953	2 rats	Holtzman	M	0.06% in the diet for 7 wks.	P.O.	0	----	7 wks.
Griffin et al., 1953a	22 rats[273]	Sprague-Dawley	M	0.06% in the diet, 9 to 19 wks.	P.O.	0	----	19 wks.
	2 rats	Sprague-Dawley	M	0.06% in the diet for 14 wks.	P.O.	Tumors[274]	----	14 wks.
Griffin et al., 1953b	Rats[272]	----	M	0.06% in the diet	P.O.	0	----	----
Meechan et al., 1953	49 rats	Sprague-Dawley	M&F	0.06% in the diet	P.O.	Tumors[275]	Sacrificed at intervals	39 wks.
Richardson et al., 1953	26 rats[273]	----	M	0.06% in the diet	P.O.	0[276]	Sacrificed at intervals	19 wks.
Robertson et al., 1953	Rats	Sprague-Dawley	M	0.06% in the diet; mice pair-fed	P.O.	Tumors[277]	3 sacrificed at 13 wks.	13 wks.
	Rats	Sprague-Dawley	M	0.06% in the diet; pituitary gonadotrophin also administered	P.O.	10[274]	10 sacrificed at 13 wks.	13 wks.
	Rats	Sprague-Dawley	M	0.06% in the diet; DOCA also administered	P.O.	0	----	13 wks.
	Rats	Sprague-Dawley	M	0.06% in the diet; testosterone also administered	P.O.	3[274]	3 sacrificed at 13 wks.	13 wks.
	Rats	Sprague-Dawley	M	0.06% in the diet; ACTH also administered	P.O.	11[274]	11 sacrificed at 13 wks.	13 wks.
	Rats	Sprague-Dawley	M	0.06% in the diet; thiourea also administered	P.O.	Tumors[274]	6 sacrificed at 13 wks.	21 wks.
	Rats	Sprague-Dawley	M	0.06% in the diet; cortisone also administered	P.O.	3[274]	3 sacrificed at 13 wks.	13 wks.
	12 rats[273]	Sprague-Dawley	M	0.06% in the diet; pituitary gonadotrophin also administered	P.O.	0	6 sacrificed at 14 wks.	21 wks.
	24 rats[273]	Sprague-Dawley	M	0.06% in the diet; ACTH also administered	P.O.	3[274]	12 sacrificed by 14 wks.	21 wks.
	12 rats[273]	Sprague-Dawley	M	0.06% in the diet; DOCA also administered	P.O.	0	6 sacrificed by 13 wks.	21 wks.
	12 rats[273]	Sprague-Dawley	M	0.06% in the diet; testosterone also administered	P.O.	0	5 sacrificed by 14 wks.	21 wks.
	12 rats[273]	Sprague-Dawley	M	0.06% in the diet; saline also administered	P.O.	0	6 sacrificed by 14 wks.	28 wks.
	Rats[273]	Sprague-Dawley	M	0.06% in the diet; cortisone also administered	P.O.	0	4 sacrificed by 14 wks.	At least 14 wks.

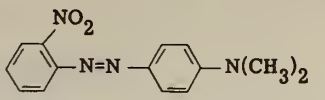
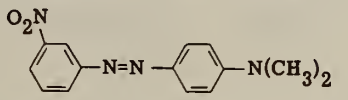
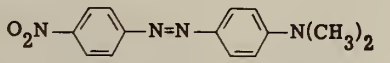
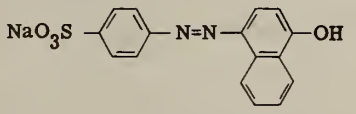
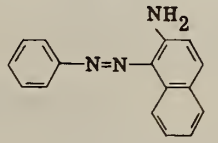
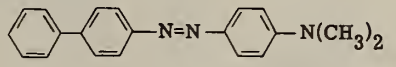
[272] Some hypophysectomized.
[273] Hypophysectomized.
[274] Hepatomas.
[275] 34 with benign or malignant hepatomas.
[276] 2 with pituitary remnants had cirrhosis.
[277] 3 hepatomas.

Reference	Animal	Strain or type	Sex	Preparation and dose	Site and route	Animals with tumors	Survival	Duration of experiment
659.--4'-METHYL-4-DIMETHYLAMINOAZOBENZENE 								
Miller et al., 1948	38 rats	Sprague-Dawley	M	0.054 or 0.058% in the diet	P.O.	Tumors[276a]	----	At least 16 wks.
Sorof et al., 1951	4 rats	Sprague-Dawley	M	0.064% in the diet	P.O.	0[277a]	----	8 wks.
Lacassagne et al., 1952	8 rats	----	----	0.06% in the diet	P.O.	0	----	186 d.
MacDonald et al., 1952	17 rats	Albino	M	0.064% in the diet	P.O.	0	17 alive at 130 d.	210 d.
	15 rats	Albino	M	0.064% in the diet for 90 d.	P.O.	0	15 alive at 130 d.	220 d.
660.--N-METHYL-N-ETHYL-p-AMINOAZOBENZENE 								
Miller and Miller, 1948	12 rats	Sprague-Dawley	M	0.064% in the diet for 4 mos.	P.O.	Tumors[274]	----	6 mos.
Sugiura et al., 1953	15 rats	Sherman	M	0.064% in the diet for 110 to 250 d.	P.O.	Tumors[278]	----	250 d.
	15 rats	----	----	----	P.O.	Tumors[278]	----	250 d.
661.--N-METHYL-2'-ETHYL-p-AMINOAZOBENZENE 								
Sugiura et al., 1953	15 rats	----	----	----	P.O.	0	----	250 d.
662.--N-METHYL-4'-ETHYL-p-AMINOAZOBENZENE 								
Sugiura et al., 1953	15 rats	----	----	----	P.O.	Tumors[279]	----	250 d.
663.--N-METHYL-2'-METHYL-p-AMINOAZOBENZENE 								
Sugiura, 1948	15 rats	Sherman	M	0.06% in the diet for 98 to 250 d.	P.O.	Tumors[280]	----	250 d.
Sugiura et al., 1953	15 rats	----	----	----	P.O.	Tumors[281]	----	250 d.

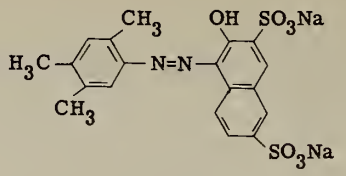
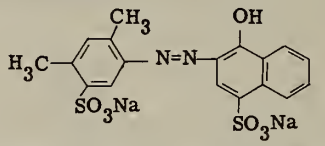
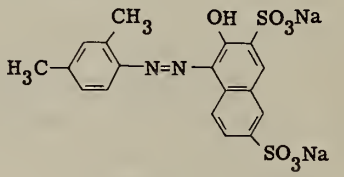
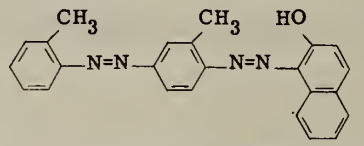
[274] Hepatomas.
[276a] No details, weakly active.
[277a] Pathology not discussed.
[278] 67% with hepatomas.
[279] Hepatomas.
[280] 27% with hepatomas, 1 with metastases.
[281] 27% with hepatomas.

Reference	Animal	Strain or type	Sex	Preparation and dose	Site and route	Animals with tumors	Survival	Duration of experiment
664.--N-METHYL-3-METHYL-p-AMINOAZOBENZENE 								
Miller and Miller, 1948	12 rats	Sprague-Dawley	M	0.060% in the diet for 7 mos.	P.O.	Tumors[282]	----	9 mos.
665.--N-METHYL-3'-METHYL-p-AMINOAZOBENZENE 								
Miller and Miller, 1948	12 rats	Sprague-Dawley	M	0.060% in the diet for 3 mos.	P.O.	Tumors[283]	----	4 mos.
Sugiura, 1948	15 rats	Sherman	M	0.06% in the diet for 141 to 225 d.	P.O.	Tumors[284]	----	225 d.
666.--N-METHYL-4'-METHYL-p-AMINOAZOBENZENE 								
Sugiura, 1948	15 rats	Sherman	M	0.06% in the diet for 100 to 250 d.	P.O.	Tumors[285]	----	250 d.
Sugiura, et al., 1953	15 rats	----	----	----	P.O.	Tumors[285]	----	250 d.
667.--METHYL RED 								
Willheim and Ivy, 1953	10 rats	Wistar	M&F	4% of the diet	P.O.	0	----	18 mos. to 2 yrs.
668.--1-NAPHTHALENEAZO-2',4'-DIAMINOBENZENE 								
Hackmann, 1951a	20 rats	Heterozygotic	----	0.1% in the diet	P.O.	4[286]	17 alive at 1 yr.	At least 2 yrs.
669.--4-NITROBENZENEAZO-4'-DIPHENYLAMINE 								
Hackmann, 1951a	20 rats	Heterozygotic	----	0.1% in the diet	P.O.	4[287]	17 alive at 1 yr.	At least 2 yrs.

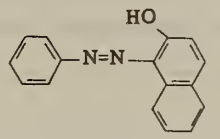
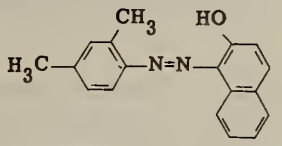
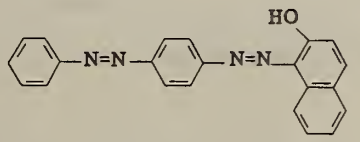
[282] 9% with hepatomas.
[283] 92% with hepatomas.
[284] 100% with hepatomas, 3 with metastases.
[285] 20% with hepatomas.
[286] Spindle cell sarcoma of the liver with metastases to the pleura and omentum, carcinoma of the forestomach, lymphatic leukemia, and 3 fibroadenomas.
[287] Fibroadenomas of the breast.

Reference	Animal	Strain or type	Sex	Preparation and dose	Site and route	Animals with tumors	Survival	Duration of experiment
670. --2'-NITRO-4-DIMETHYLAMINOAZOBENZENE 								
Miller and Miller, 1948	12 rats	Sprague-Dawley	M	0.072% in the diet for 4 mos.	P.O.	Tumors[288]	----	7 mos.
671. --3'-NITRO-4-DIMETHYLAMINOAZOBENZENE 								
Miller and Miller, 1948	12 rats	Sprague-Dawley	M	0.072% in the diet for 4 mos.	P.O.	Tumors[289]	----	7 mos.
672. --4'-NITRO-4-DIMETHYLAMINOAZOBENZENE 								
Miller et al., 1949	14 rats	Albino	M	2.67 m.mols per kg. in the diet for 8 mos.	P.O.	0	12 alive at 10 mos.	14 mos.
673. --ORANGE I 								
Willheim and Ivy, 1953	10 rats	Wistar	M&F	4% of the diet	P.O.	0	Animals died in a few mos.	----
674. --PHENYLAZO-2-NAPHTHYLAMINE[290] 								
Willheim and Ivy, 1953	10 rats	Wistar	M&F	4% of the diet	P.O.	0	Most animals died in a few mos.	----
675. --4'-PHENYL-4-DIMETHYLAMINOAZOBENZENE 								
Lacassagne et al., 1952	9 rats	----	----	0.06% in the diet	P.O.	0	----	203 d.

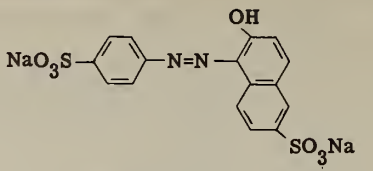
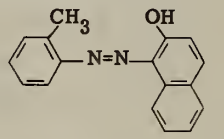
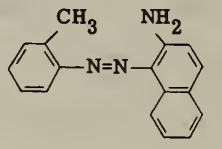
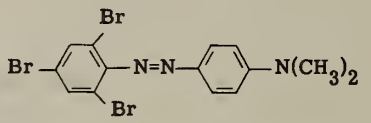
[288] 46% with hepatomas.
[289] 83% with hepatomas.
[290] Yellow AB; FD & C Yellow 3.

Reference	Animal	Strain or type	Sex	Preparation and dose	Site and route	Animals with tumors	Survival	Duration of experiment
676.--PONCEAU 3 R[291] 								
Willheim and Ivy, 1953	10 rats	Wistar	M&F	4% of the diet	P.O.	0[292]	----	18 mos. to 2 yrs.
677.--PONCEAU SX[293] 								
Willheim and Ivy, 1953	10 rats	Wistar	M&F	4% of the diet	P.O.	Tumor[293a]	----	18 mos. to 2 yrs.
678.--PONCEAU XYLIDINE 								
Willheim and Ivy, 1953	10 rats	Wistar	M&F	4% of the diet	P.O.	0	----	18 mos. to 2 yrs.
679.--SCARLET RED 								
Echert et al., 1935	161 mice	Mixed breed, white	----	25% in olive oil painted 3 times weekly on dorsal surface of neck and 7 s.c. injections of 0.50 - 0.75 cc. at same site over total time	Skin, S.C.	0	64 alive at 312 d.	At least 312 d.
Breedis, 1950	Salamander	Triturus viridescens	----	In olive oil, 1 injection	S.C.	0	----	----

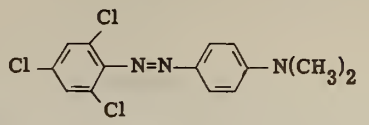
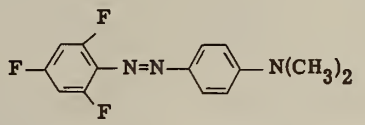
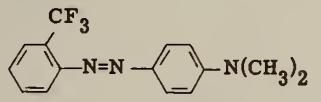
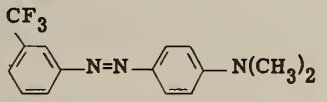
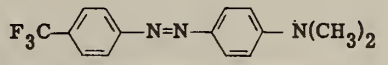
[291] FD & C Red 1.
[292] 3 cases of liver cirrhosis.
[293] FD & C Red 4.
[293a] 1 lymphosarcoma; 50 controls had no tumors.

Reference	Animal	Strain or type	Sex	Preparation and dose	Site and route	Animals with tumors	Survival	Duration of experiment
679.--SCARLET RED--Continued								
Polettini, 1950	10 rabbits	----	----	Saturated solution (Fettponceau) in vaseline oil, 1 cc.; after 20 d. 8 animals received croton oil, 0.03% in acetone twice weekly paintings	S.C.	0	7 alive	25 wks.
Smith, W.E., 1950	Mice	C	M	Saturated soln. in olive oil (0.025 cc.) with fetal lung	S.C.	Tumors[294]	----	143 d.
Breedis, 1952	10 sala-manders	Triturus viridescens	----	0.005 - 0.02 cc. of 4% in olive oil	S.C.	0	----	----
Willheim and Ivy, 1953	10 rats	Wistar	M&F	4% (Sudan IV) of the diet	P.O.	0[295]	----	18 mos. to 2 yrs.
680.--SUDAN I 								
Kirby and Peacock, 1949	36 mice	Stock	M&F	17 to 20 injections of 0.25 ml., 3% dye in arachis oil at 3 wk. intervals	S.C.	Tumors[296]	At least 12 alive at 419 d.	600 - 615 d.
Hackmann, 1951a	20 rats	Heterozygotic	----	0.01% in the diet	P.O.	0	17 alive at 1 yr.	At least 3 yrs.
681.--SUDAN II[297] 								
Willheim and Ivy, 1953	10 rats	Wistar	M&F	4% of the diet	P.O	0	Most animals died in a few mos.	----
682.--SUDAN III 								
Willheim and Ivy, 1953	10 rats	Wistar	M&F	4% of the diet	P.O.	0	----	18 mos. to 2 yrs.

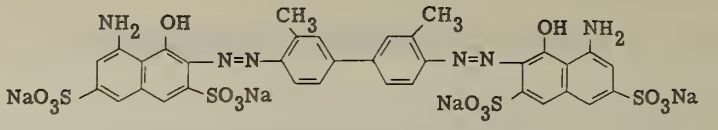
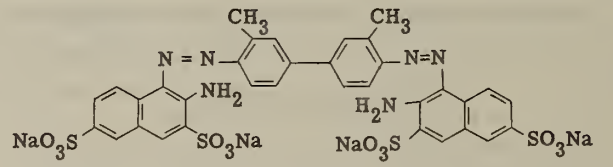
[294] 1 mouse with pulmonary adenoma in an implant.
[295] 1 case of liver cirrhosis.
[296] 7 hepatomas, 1 adenoma of the lung and adenocarcinoma of the lung. 1 ulcerated tumor at site of injection (histological characteristics of squamous carcinoma).
[297] Sudan Red II; FD & C Red 32.

Reference	Animal	Strain or type	Sex	Preparation and dose	Site and route	Animals with tumors	Survival	Duration of experiment
683.--SUNSET YELLOW[298] 								
Willheim and Ivy, 1953	10 rats	Wistar	M&F	4% of the diet	P.O.	0	----	18 mos. to 2 yrs.
TARTRAZINE--See under Heterocyclic Compounds								
684.--o-TOLYLAZO-β-NAPHTHOL[299] 								
Willheim and Ivy, 1953	10 rats	Wistar	M&F	4% of the diet	P.O.	0	Most animals died in a few mos.	----
685.--1-o-TOLYLAZO-2-NAPHTHYLAMINE[300] 								
Druckrey and Schmahl, (unpub. data)	74 rats	BD I, BD III, white	----	9 mg. daily (total dose 9.6 g.)	P.O.	2[301]	37 alive at 1 yr.	32 mos.
Willheim and Ivy, 1953	10 rats	Wistar	M&F	4% of the diet	P.O.	0	Died in a few months	----
686.--2',4',6'-TRIBROMO-4-DIMETHYLAMINOAZOBENZENE 								
Miller et al., 1949	14 rats	Albino	M	2.67 m.mols per kg. in the diet for 8 mos.	P.O.	0	11 alive at 10 mos.	14 mos.

[298] FD & C Yellow 6.
[299] Orange SS; FD & C Orange 2.
[300] Yellow OB; FD & C Yellow 4.
[301] Uterine carcinoma and pancreas adenoma after 17 and 22 months.

Reference	Animal	Strain or type	Sex	Preparation and dose	Site and route	Animals with tumors	Survival	Duration of experiment
687.--2',4',6'-TRICHLOR-4-DIMETHYLAMINOAZOBENZENE 								
Miller et al., 1949	14 rats	Albino	M	2.67 m.mols per kg. in the diet for 10 mos.	P.O.	0	9 alive at 10 mos.	14 mos.
688.--2',4',6'-TRIFLUORO-4-DIMETHYLAMINOAZOBENZENE 								
Miller et al., 1953	16 rats	Holtzman	M	0.049 - 0.066% in the diet for 3 mos.; 0.066% for one wk. only	P.O.	13[302]	15 alive at 5 mos.	5 mos.
689.--2'-TRIFLUOROMETHYL-4-DIMETHYLAMINOAZOBENZENE 								
Miller et al., 1949	14 rats	Albino	M	2.67 m.mols per kg. for 5 wks., then 2.13 m.mols per kg. for 7 mos.	P.O.	0	9 alive at 10 mos.	12 mos.
690.--3'-TRIFLUOROMETHYL-4-DIMETHYLAMINOAZOBENZENE 								
Miller et al., 1949	14 rats	Albino	M	2.67 m.mols per kg. for 5 wks., then 2.13 m.mols per kg. for 7 mos.	P.O.	0	8 alive at 10 mos.	12 mos.
691.--4'-TRIFLUOROMETHYL-4-DIMETHYLAMINOAZOBENZENE 								
Miller et al., 1949	14 rats	Albino	M	2.67 m.mols per kg. for 5 wks., then 2.13 m.mols per kg. for 7 mos.	P.O.	0	11 alive at 10 mos.	12 mos.

[302] Hepatomas.

Reference	Animal	Strain or type	Sex	Preparation and dose	Site and route	Animals with tumors	Survival	Duration of experiment
692.--TRYPAN BLUE 								
Gillman et al., 1948	Rats	----	----	1 cc. of a 1% soln. every two wks.	S.C.	Tumors[303]	----	Over 200 d.
Gillman and Gillman, 1949	Rats	Stock	M&F	0.5 - 1.0 cc. of a 1% soln. in distilled water, weekly or every 2 wks., 12 injections on an average	S.C.	Tumors[304]	----	Average of 161 d.
Gillman et al., 1949	130 rats	Stock	M&F	0.5 or 1.0 cc. of a 1% soln. in distilled water every week, 12 injections on an average, and every two wks., 13 injections on an average	S.C.	Tumors[305]	----	140 d. avg.
Gillman, 1951	Rats	----	----	Repeated injections every 2 wks., of 1 ml. of a 1% soln.	S.C.	Tumors[306]	----	480 d.
Gillman and Gillman, 1952	193 rats	----	M&F	5 mg. per wk. or 10 mg. every two wks. as 0.5 or 1.0% soln. in distilled water	S.C.	Tumors[307]	----	410 d.
Simpson, 1952	53 rats	Hooded	M&F	1 ml. of a 1% aqueous soln. every 2 wks. until death[307a]	S.C.	Tumors[308]	5 died before 150 d.	550 d.
Marshall, 1953	22 rats	Wistar	M&F	1 cc. of a 1% aqueous soln., 4 injections every two wks.	S.C.	Tumors[309]	12 killed at 6 mos.	1 yr.
	45 rats	Wistar	M&F	1.5 cc. of a 1% aqueous soln. every 2 wks. for 8 mos.	S.C.	Tumors[310]	----	340 d.
693.--VITAL RED 								
Marshall, 1953	27 rats	Wistar	M&F	1 cc. of a 2% aqueous soln. every 2 wks. for 7 mos.	I.P.	0	----	At least 7 mos.

[303] 6% with spindle cell sarcoma in the liver (84th day). 60% with reticulum cell sarcoma (190th day).

[304] Hodgkin's-like sarcoma and other lesions in lumph nodes.

[305] Spindle-cell sarcoma of liver; recticulum cell sarcoma of liver; Hodgkin's-like lesions in lumph nodes described elsewhere.

[306] Reticulo-endothelial neoplasia.

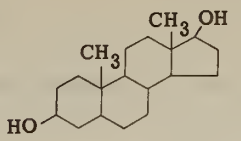
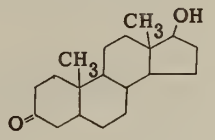
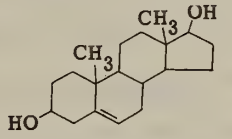
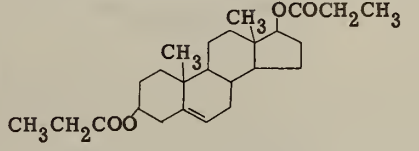
[307] Of lymph nodes, classified as plasmacytomas, histiocytomas, endotheliomas, paramonocytomas or hemangiohistioblastomas.

[307a] The dye contained impurities.

[308] 26 reticulum-cell sarcomas of the liver, average latent period 268 days. Minimum carcinogenic dose 110 mg.

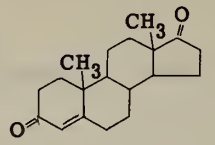
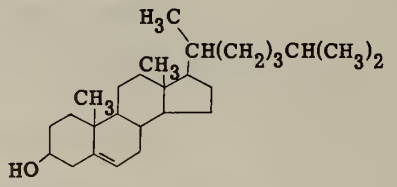
[309] 1 liver tumor, type not specified.

[310] 9 histiocystic tumors of the liver, 2 reticulum cell sarcomas, 2 lymphosarcomas.

Reference	Animal	Strain or type	Sex	Preparation and dose	Site and route	Animals with tumors	Survival	Duration of experiment
694.--ANDROSTANEDIOL-3α,17α 								
Humm et al., 1948	5 guinea pigs	----	M	Pellets, 5.8 mg. absorbed in 30 d.[310a]	S.C.	0[310b]	----	30 d.
Kochakian et al., 1949	9 guinea pigs	Albino English short haired	M	3 and 12 pellets (5.8 and 14.5 mg. absorbed in 30 d.)[310a]	S.C.	0	----	30 d.
695.--ANDROSTANE-3α,17β-DIOL								
Kochakian, 1952	Mice	White	M, castr.	1 or 5 mg. per gm. diet for 30 d.	P.O.	0	----	30 d.
696.--ANDROSTANOL-17α-ONE-3 								
Humm et al., 1948	11 guinea pigs	----	M	Pellets, 5.0-9.1 mg. absorbed in 30 d.[310a]	S.C.	0[310b]	----	30 d.
Kochakian et al., 1949	16 guinea pigs	Albino English short haired	M	1-6 pellets (1.9 - 9.1 mg. absorbed in 30 d.)[310a]	S.C.	0	----	30 d.
697.--ANDROSTENEDIOL 								
Gordan et al., 1951	9 rats	Long-Evans	M	10 mg. per kg. daily for 1 wk.	S.C.	0	----	30 d.
698.--ANDROSTENEDIOL DIPROPIONATE 								
Larizza and Chirico, 1953	Guinea pigs	----	----	10 mg. on alternate days for 44 d.	S.C.	0	----	At least 44 d.
	20 guinea pigs	----	M&F	5 mg. per d. for 36 d.	S.C.	0	----	At least 36 d.

[310a] 35 days after castration.

[310b] Pathology not reported.

Reference	Animal	Strain or type	Sex	Preparation and dose	Site and route	Animals with tumors	Survival	Duration of experiment
699. -- Δ^4-ANDROSTENEDIONE-3,17 								
Hammond, Jr., 1951	3 ferrets	----	F	Pellets, 1.52-5.47 mg. per day absorbed	S.C.	0[311a]	----	43 d.
Kochakian, 1952	Mice	White	M, castr.	1 mg. per gm. diet for 30 d.	P.O.	0	----	30 d.
700. --CHOLESTEROL 								
Truhaut, 1947a, b	40 mice	----	M&F	20% in olive oil, 1 ml. (irradiated)	S.C.	0[311]	----	At least 75 d.
	40 mice	----	M&F	20% in olive oil, 1 ml.	S.C.	0	----	----
Peacock, 1948	12 mice	----	----	---- (heated to 270 to 300° C - 0.5 hr.)	S.C.	2 sarc.	----	10 mos.
Steiner et al., 1948	2 dogs	----	----	10 gm. daily	P.O.	0	----	1 yr.
Dauber et al., 1949	Fowls	White leghorn	M&F	0.5, 1.0 or 2.0% in the diet	P.O.	0[312]	----	Over 10 wks.
Hieger, 1949	213 mice	Stock, C57, C3H, M.R.C.	M&F	15% in lard (95 - 98% pure)	S.C.	11 sarc.	77 alive at 12 mos.	24 mos.
	75 mice	C57, stock	M&F	With cod liver oil as 15% in lard (95 - 98% pure)	S.C.	5 sarc.	33 alive at 12 mos.	21 mos.
	30 mice	C57, stock	M&F	15% in lard (95 - 98% pure)	S.C.	1 sarc.	20 alive at 12 mos.	18 mos.
	20 mice	C57	M&F	With linseed and cod liver oils as 15% in lard (95 - 98% pure)	S.C.	0	19 alive at 12 mos.	24 mos.
	20 mice	C57	M&F	With linseed oil as 15% in lard (95 - 98% pure)	S.C.	0	20 alive at 12 mos.	24 mos.
	20 mice	C57	M&F	With cod liver oil as 15% in lard (95 - 98% pure)	S.C.	3 sarc.	20 alive at 12 mos.	24 mos.
	63 mice	C57, stock	M&F	15% in lard (crystalized from acetone)	S.C.	4 sarc.	41 alive at 12 mos.	18 mos.
	40 mice	C57, stock	M&F	15% in lard (refluxed KOH and alcohol)	S.C.	2 sarc.	35 alive at 12 mos.	24 mos.
	20 mice	C57, stock	M&F	10% in sesame oil (95 - 98% pure)	S.C.	1 sarc.	16 alive at 12 mos.	21 mos.

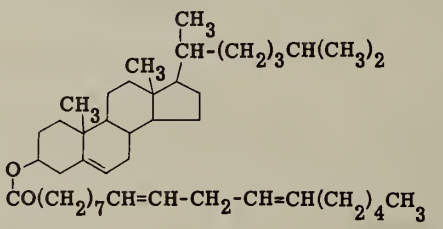
[311] 1 spontaneous lymphosarcoma in a female (died on the 75th day).
[311a] No autopsies.
[312] Atherosclerosis induced.

Reference	Animal	Strain or type	Sex	Preparation and dose	Site and route	Animals with tumors	Survival	Duration of experiment
				700.--CHOLESTEROL--Continued				
Horlick and Katz, 1949	144 fowls	White leghorn	M	0.5 - 4.0% in the diet in 5 - 15 wks.	P.O.	0[312]	----	15 wks.
Nadel, 1949	4 guinea pigs	Family 13	F	20 mg. pellet	S.C.	0	----	96 d.
Neal et al., 1949	20 fowls	----	----	Pellets	Infra-orbital sinus	0	----	730 d.
Steiner et al., 1949	2 dogs	Mongrel	----	10 gm. daily in the diet for 16 mos.	P.O.	0	100% alive	16 mos.
Cardeza, 1950	Rats[313]	----	----	Daily injection for 6 mos.	----	0	----	6 mos.
Desforges et al., 1950	9 guinea pigs	----	M&F	2 pellets, 0.3 cm. long, 20-40 mg.	Gall bladder	0	Killed at various times	41 wks.
Fishberg et al., 1950	2 dogs	----	----	10 - 20 gm. in the diet, 6 d. per wk., 9 to 11 mos.	P.O.	0	----	11 mos.
	28 rabbits	----	----	3 - 20 gms. in the diet, once weekly, 5 wks. to 27 mos.	P.O.	0[312]	----	27 mos.
Goldman, 1950	77 hamsters	Golden Syrian	M	1.0 - 6.5 gm. (total dose in capsules 50 mg. daily)	P.O.	0	17 died by 30 d.	130 d.
Horning, 1950	15 mice	A	M	Crystals plus graft of lung tissue	S.C.	0	----	----
Stamler and Katz, 1950	Fowls	Hyline	M	0.25% in the diet for 6 wks., interval, 0.25% up to 35 wks.	P.O.	0[312]	4 died by 7 wks.	35 wks.
Stamler et al., 1950d	48 fowls	Hyline	M	2% in the diet	P.O.	0	----	17 wks.
	72 fowls	Hyline	M	0.25 - 2.0% in the diet, (various diets)	P.O.	0[312]	13 alive	35 wks.
Baguena et al., 1951	7 rabbits	----	M&F	0.10 - 0.60 gm. per 600 gm. body wt. dissolved in pure olive oil	P.O.	0[312]	Killed at various times	56 d.
Greenberg and Rinehart, 1951	12 monkeys	Rhesus	M&F	1% in the diet (Pyridoxine free and control)	P.O.	0	----	65 wks.
Kellner et al., 1951	17 rabbits	Market	M&F	0.3 or 1.0 gm. in the diet, 3 times weekly for 9 or 13 wks., also given "Tween 80" intravenously.	P.O.	0[312]	100% alive	9 or 13 wks.
	12 rabbits	Market	M&F	0.5 or 1.0 gm. in the diet, 3 times weekly for 9 wks., also given "Triton A20" intravenously	P.O.	0[314]	----	9 wks.
	7 rabbits	Market	M&F	0.5 gm. in the diet, 3 times weekly for 13 wks.	P.O.	0[315]	100% alive	13 wks.

[312] Atherosclerosis induced.
[313] Castrated and 95% of the pancreas removed.
[314] 11 with atherosclerosis.
[315] 5 with atherosclerosis.

Reference	Animal	Strain or type	Sex	Preparation and dose	Site and route	Animals with tumors	Survival	Duration of experiment
700.--CHOLESTEROL--Continued								
Marx et al., 1951	6 hamsters	----	----	10% in the diet	P.O.	0	----	28 wks.
	7 rabbits	----	----	1% in the diet, 15 - 21 wks.	P.O.	0	----	21 wks.
Osborn et al., 1951	6 dogs	----	----	50 - 75 mg. per kg. weekly for 2 to 6 wks.	I.V.	0	4 died	6 mos.
Payne and Duff, 1951	19 rabbits	Albino	M	1 gm. daily in the diet (1%), in addition some given Tween 80 orally or intravenously.	P.O.	0	6 died	65 d.
Robbard et al., 1951	>93 fowls	Hyline	M	2% in the diet	P.O.	0	Sacrificed at intervals	26 wks.
Cook et al., 1952	16 rabbits	----	----	0.063 - 1.0% in the diet	P.O.	0	----	112 d.
Kelly et al., 1952	23 rabbits	Various	M	1.5 - 3.0% lipid-cholesterol mixture in the diet	P.O.	0	Sacrificed at intervals	76 wks.
Page and Brown, 1952	21 rats	----	M&F	4% in the diet	P.O.	0	13 alive at 6 mos.	8 mos. - 14 mos.
Pick et al., 1952	Chicks	Hyline	M	2% in the diet	P.O.	0	Sacrificed at intervals	13 wks.
Pierce, 1952	30 rabbits	New Zealand	M&F	1% in the diet	P.O.	0	----	11 wks.
Weiss et al., 1952	Rats	U.S.C.	F	2% in the diet	P.O.	0	----	7 wks.
Wolffe et al., 1952	8 geese	----	----	2 gm. in the diet daily for 90 d.	P.O.	0	----	90 d.
Altschul, 1953	18 rabbits	Albino & colored	M&F	0.3 gm. daily in gelatin capsules	P.O.	0	1 died at 71 d.	90 d.
Clement et al., 1953	Rats	Wistar	----	5% in the diet for 6 mos.	P.O.	0	----	At least 6 mos.
Jones, R.J., et al., 1953	12 fowls	White Rock	M	10% in the diet	P.O.	0	----	5 wks.
Rannie and Duguid, 1953	20 rabbits	----	----	1.5 gm. of crystals daily	P.O.	0[312]	Killed at intervals	48 wks.
Siperstein et al., 1953a	fowls	White leghorn	M	1% in the diet	P.O.	0	----	11 wks.
Siperstein et al., 1953b	3 fowls	White leghorn	M	1% in the diet	P.O.	0	----	5 mos.
Stamler et al., 1953	20 fowls	Hyline	M	1 or 2% in the diet	P.O.	0	----	5 - 7 wks.

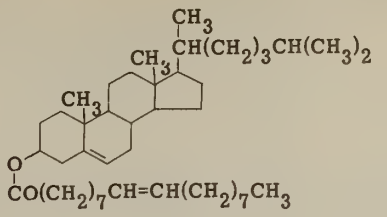
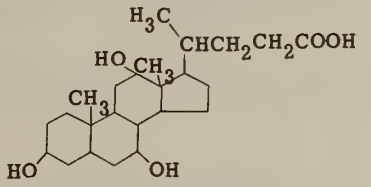
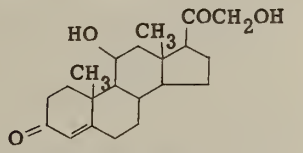
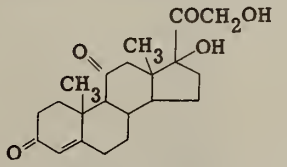
701.--CHOLESTERYL LINOLEATE



Kirby, 1948b	19 mice	Stock	M&F	10% in benzene, 3 times weekly for 593 days (heated for 300° C for 2 hrs.), 0.5% croton oil added	Skin	0[316]	5 alive at 593 d.	640 d.

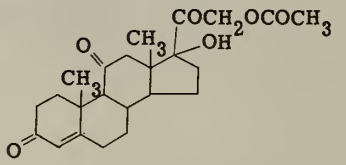
[312] Atherosclerosis induced.

[316] 2 mammary carcinomas, probably spontaneous.

Reference	Animal	Strain or type	Sex	Preparation and dose	Site and route	Animals with tumors	Survival	Duration of experiment
702.--CHOLESTERYL OLEATE 								
Kirby, 1948b	43 mice	Stock	M&F	20 or 25% soln. in arachis oil, 0.5 ml. injected twice (heated to 300° C. for 2 hrs.)	S.C.	0[317]	13 alive at 200 d.	At least 518 d.
	29 mice	Stock	M&F	10 - 15% in benzene 3 times weekly (heated to 300° C. for 2 hrs.) 0.5% croton oil added	Skin	0	7 alive at 285 d.	At least 285 d.
	15 rats	Wistar	M&F	25 mg. in the diet daily for 615 d. (Commercial product)	P.O.	0[318]	14 alive over 349 d.	2 yrs.
703.--CHOLIC ACID 								
Page and Brown, 1952	14 rats	----	M&F	2% in the diet	P.O.	0	10 alive at 6 mos.	8 mos.
704.--CORTICOSTERONE 								
Hayes, 1953	6 rats	Long-Evans	M	0.01 cc. of a 1 mg. per cc. ethyl alcohol soln.	Skin	0	----	6 mos.
705.--CORTISONE 								
Castor and Baker, 1950	Rats	Long-Evans & Wistar	M&F	25 - 100 μg. in 0.1 cc. of 25% alcohol daily	Skin	0	----	At least 180 d.
Boyland and Sargent, 1951	5 mice	B	----	10 mg. per ml. in saline, 0.05 ml. of soln. in 20 sites	Intradermal	0	----	----

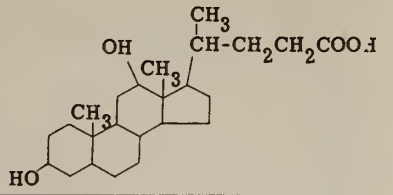
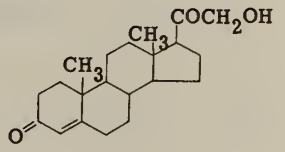
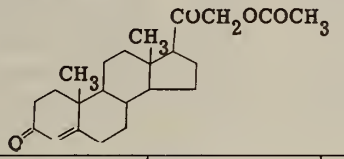
[317] 1 mammary adenocarcinoma, 6 leukemic infiltrations, all probably spontaneous.

[318] 1 adenocarcinoma of uterus was noted but presumed spontaneous.

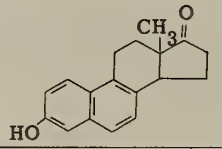
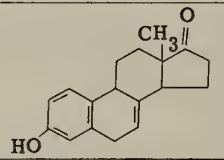
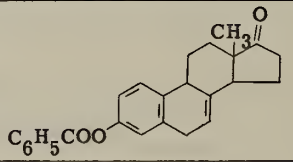
Reference	Animal	Strain or type	Sex	Preparation and dose	Site and route	Animals with tumors	Survival	Duration of experiment
705.--CORTISONE--Continued								
Sala et al., 1951	10 rats	----	M	1 mg. in 0.5 ml. saline, daily for 70 d.	S.C.	----	10 alive	70 d.
	Rats	----	M	1 or 5 mg.	----	0	----	70 d.
Cook et al., 1952	4 rabbits	----	----	5 mg. per d. five d. per wk.	S.C.	0	----	112 d.
Engelbreth-Holm and Asboe-Hansen, 1953	35 mice	St/Eh	M&F	0.2 mg. daily	I.P.	0	----	8 wks.
Welbourn and Code, 1953	10 rats	Sprague-Dawley	M&F	1 mg. per d. for 23 to 30 d.	S.C.	0	----	30 d.
706.--CORTISONE ACETATE 								
Winter et al., 1950	40 rats	Holtzman	M	3 mg. daily in saline for 6 wks.	S.C.	0	Sacrificed at various times	45 d.
Cavallero et al., 1951	10 rats	----	M	1 mg. daily for 70 d.	S.C.	0	----	70 d.
Ershoff, 1951	24 rats	Long Evans	M&F	200 mg. per kg. of diet, (varied diets)	P.O.	0	Some died	6 wks.
	48 rats	Long Evans	M&F	100 or 400 mg. per kg. of the diet	P.O.	0	Some died	6 wks.
Follis, Jr. 1951	Rabbits	----	----	5 - 80 mg. per kg. per d.	----	0	----	37 d.
	Guinea pigs	----	----	5 - 50 mg. per kg. per d.	----	0	----	37 d.
Kochakian and Robertson, 1951	6 mice	----	Castr.	14 mg. pellet implanted, 0.28 mg. absorbed	S.C.	0	----	30 d.
Bergstrand, 1952	6 rabbits	----	M&F	1 or 2 mg. 1 - 3 days	S.C.	0	----	31 d.
Hamburger, 1952	4 rabbits	----	M	5 or 15 mg. daily in aqueous susp. (animals also received pregnant mare's serum gonadotrophin)	S.C.	0	----	59 d.
Greenspan et al., 1953	10 rats	Albino	M	3.75 mg. per d. for 40 d.	S.C., I.P.	0	----	40 d.
	15 rats	Albino	F	1.25 mg. per d. for 14 d., 2.5 mg. per d. for 14 d., 3.75 mg. per d. for 20 d., in saline	S.C., I.P.	0	----	48 d.
Knobil et al., 1953	3 monkeys	Rhesus	F	50 mg. per d. for 33 d.	I.M.	0	----	33 d.
O'Neal and Heinbecker, 1953	4 dogs	----	----	100 mg. daily, 45 - 199 d.	I.M.	0	----	199 d.
	Rats	----	M&F	3 mg. daily for 30 d.	S.C.	0	----	30 d.
Williams, 1953	8 guinea pigs[320]	----	F	5 mg. per 100 g. body wt. daily for 15 d.; from the 30th day of experiment animals given desiccated thyroid (8 mg. orally) every other day	I.M.	0[320a]	----	45 d.

[320] Thyroidectomized.

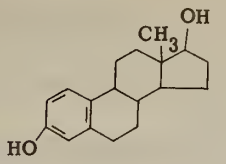
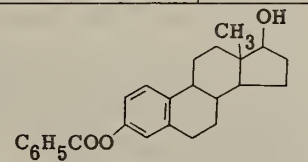
[320a] No pathology reported.

Reference	Animal	Strain or type	Sex	Preparation and dose	Site and route	Animals with tumors	Survival	Duration of experiment
707.--DESOXYCHOLIC ACID 								
Klein, 1952b	40 mice	C3H	M	4.0 mg. per ml. olive oil (0.04 ml. per mouse)	I.M.	0	----	At least 355 d.
	120 mice	C3H	M	4.0 mg. per ml. 1.0 or 3.0% soln. of croton oil in olive oil (0.04 ml. per mouse)	I.M.	0	----	332 d. or 352 d.
708.--DESOXYCORTICOSTERONE 								
Cardeza, 1950	Rats[321]	----	----	Daily injection for 6 mos.	----	0	----	6 mos.
Combescot and Riviere, 1953	1 monkey	----	----	100 mg. pellets	S.C.	0	----	6 mos.
Jasmin and Gosselin, 1953	10 rats[322]	Piebald	F	35 mg. tablet implanted twice (1st and 32nd d.) plus 1% soldium chloride in drinking water	S.C.	0	2 died by 5 wks.	50 d.
709.--DESOXYCORTICOSTERONE ACETATE 								
Houssay and Higgins, 1949	22 mice[322]	CBA	M&F	0.1 - 1.0 mg. in sesame oil, 5 times weekly, 33 - 51 d.	S.C.	0	----	51 d.
Lewis et al., 1949	3 rats	Albino	F	2.5 mg. in sesame oil, daily injection	----	0	----	40 d.
Hall et al., 1950	30 rats	Holtzman	M, castr. & F	50 mg. crystalline pellet	S.C.	0	----	30 d.
DeMuro and Rowinski, 1951	3 dogs	----	M&F	1.5 - 2.1 mg. daily (total dose 600 mg. or 320 mg.)	I.M.	----	----	33 d.
Freed et al., 1951	Rats	Long Evans	M	4 mg. in benzyl alcohol 3 times weekly, some nephrectomized	S.C.	0	----	10 wks.
Ambrad-Dominguez and Cardeza, 1952	21 rats	White	F, castr.	0.25 mg. per d. in saline soln., daily up to 258 d.	S.C.	0[323]	Killed at 6 mos. or 258 d.	9 mos.

[321] Castrated and 95% of the pancreas removed.
[322] Gonadectomized.
[323] 15% with adrenal adenomas. 2 animals with undifferentiated reticulo-sarcoma in the abdominal cavity at 9 months. Untreated castrated controls had 37.5% adrenal adenomas.

Reference	Animal	Strain or type	Sex	Preparation and dose	Site and route	Animals with tumors	Survival	Duration of experiment
709.--DESOXYCORTICOSTERONE ACETATE--Continued								
Bergstrand, 1952	4 rabbits	----	M&F	2.5 - 10 mg. in sesame oil, 3 times weekly	S.C.	0	----	34 d.
Justin-Besancon et al., 1953	Rats	Wistar	M	5 mg. daily in 1 ml. olive oil	S.C.	0	----	40 d.
Salgado, 1953	100 rats	Sprague-Dawley	M	20 mg. tablet implanted, plus 1% sodium chloride in drinking water	S.C.	0	10 killed at 91 d.	133 d.
Salgado and Selye, 1953	30 rats[324]	Albino	F	10 mg. per day crystalline	S.C.	0	----	Over 32 d.
710.--EQUILENIN 								
Cardeza, 1950	Rats[321]	----	----	Daily injection for 6 mos.	----	0	----	6 mos.
711.--EQUILIN 								
Kaufmann et al., 1949	77 mice	BI-H	M	0.1% in sesame oil, 50 μg. weekly, (0.05 ml.)	S.C.	17[325]	----	At least 39 mos.
	63 mice	BI-H	F	0.1% in sesame oil, 50 μg. weekly, (0.05 ml.)	S.C.	52[325b]	----	43 mos.
	23 mice	BI-C	F	0.1% in sesame oil, 50 μg. weekly, (0.05 ml.)	S.C.	6[325a]	----	----
	34 mice	BI-C	M	0.1% in sesame oil, 50 μg. weekly, (0.05 ml.)	S.C.	0	----	----
712.--EQUILIN BENZOATE 								
Kaufmann et al., 1949	58 mice	BI-C	F	0.1% in sesame oil, 50 μg. weekly, (0.05 ml.)	S.C.	2[325a]	----	----
	55 mice	BI-C	M	0.1% in sesame oil, 50 μg. weekly, (0.05 ml.)	S.C.	6[325a]	----	----
	75 mice	BI-C	F	0.1% in benzene weekly, (ca 1 per 40 ml.)	Skin	3[325a]	----	----
	57 mice	BI-C	M	0.1% in benzene weekly, (ca 1 per 40 ml.)	Skin	1[325a]	----	----
	79 mice	BI-H	F	0.1% in sesame oil, 50 μg. weekly, (0.05 ml.)	S.C.	47[326]	----	At least 27 mos.
	72 mice	BI-H	M	0.1% in sesame oil, 50 μg. weekly, (0.05 ml.)	S.C.	35[326a]	----	Up to 43 mos.
	37 mice	BI-H	F	0.1% in benzene weekly, (ca 1 per 40 ml.)	Skin	0[327]	----	At least 31 mos.
	44 mice	BI-H	M	0.1% in benzene weekly, (ca 1 per 40 ml.)	Skin	14[327a]	----	35 mos.

[321] Castrated and 95% of the pancreas removed.
[324] Some hypophysectomized.
[325] Mammary adenocarcinomas 22% (0 in controls).
[325a] Mammary tumors.
[325b] Mammary adenocarcinomas (82%). Controls had 46%.
[326] Mammary adenocarcinomas, (46% in controls).
[326a] Mammary adenocarcinomas. Controls had 0.
[327] 60% mammary adenocarcinomas, (83% in controls).
[327a] 32% mammary adenocarcinomas. Controls had 0.

Reference	Animal	Strain or type	Sex	Preparation and dose	Site and route	Animals with tumors	Survival	Duration of experiment
713.--ESTRADIOL 								
Noble and Collip, 1941	Rats	----	M	Pellets	S.C.	0[328]	----	----
Bruzzone et al., 1948	Guinea pigs	----	----	Pellets	Thoracic cavity	Tumors[328a]	----	126 d.
Atkinson et al., 1949	14 rats	Sherman	F, castr.	5 or 10 μg weekly in 0.2 cc. of sesame oil, also on Vitamin E deficient diet	S.C.	0	Sacrificed at 5 - 10 mos.	10 mos.
Cardeza, 1950	Rats[321]	----	----	Daily injection for 6 mos.	----	Tumors[329]	----	6 mos.
Ferret, 1951	Rats[330]	Wistar	F	Pellet, 5 mg., various deficient diets	Spleen	0[331]	----	----
Grattarola, 1951	23 rats	----	F, castr.	0.01 - 5 mg. weekly for 4 or 5 wks.	----	0[331a]	----	5 wks.
Rakoff et al., 1951	Hamsters	----	----	Aqueous suspension of crystals, 100 to 200 μg. weekly	S.C.	0[332]	----	Over 4 wks.
Graffi and Gummel, 1952	60 mice	----	----	0.5% soln. in acetone for 8 wks. (total 125 μg. per animal per wk.), plus croton oil, 5% soln. in paraffin oil, once weekly	Skin	0	14 alive at 6 mos.	1 yr.
	40 mice	----	----	0.5% soln. in acetone for 4 wks., plus croton oil, 5% soln. in paraffin oil, once weekly	Skin	Pap.	13 alive at 6 mos.	1 yr.
Kirkman, 1952	Hamsters	Golden	M	Pellets, 24 mg. absorbed in 355 d.	S.C.	93%[333]	----	406 d. avg.
Kirkman and Bacon, 1952b	15 hamsters	Golden	M	Pellets	S.C.	15[334]	----	335 d. avg.
Hayes, 1953	6 rats	Long-Evans	M	0.1 cc. of a 1 mg. per cc. ethyl alcohol soln.	Skin	0	----	6 mos.
Iglesias et al., 1953	9 guinea pigs	----	F	1% pellets of 23 to 30 mg., animals had intrasplenic ovarian grafts	S.C.	Tumors[335]	----	828 d.
Light and Tornaben, 1953a	5 rats	Carworth	M	200 mg. of ointment daily containing 30 μg. of estradiol ointment	Skin	----	----	201 d.
Light and Tornaben, 1953b	5 rats	Carworth	F	Ointment	Skin	0	----	186 d.
714.--ESTRADIOL BENZOATE 								
Lipschütz and Vargas, Jr., 1939b	7 guinea pigs	----	F	80 μg. in olive oil, 3 times weekly	S.C.	4 tumors[336]	----	64 - 119 d.

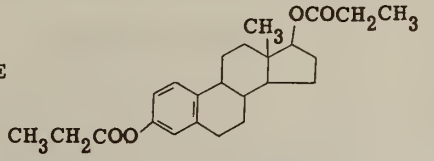
[321] Castrated and 95% of the pancreas removed.
[328] Mammary tumors.
[328a] Abdominal fibroids.
[329] Of the pancreas.
[330] Ovariectomized.
[331] Hepatic necrosis.
[331a] Pathology not reported.
[332] Cystic hyperplasia of the endometrium.
[333] Renal tumors, 47% with metastases.
[334] Renal tumors, 40% with metastases.
[335] 1 adenofibroma (Brenner tumor type), fibroid of uterus.
[336] Of pylorus, between spleen and intestine, mesentery, parietal peritoneum (2 of these alone had uterine tumors).

Reference	Animal	Strain or type	Sex	Preparation and dose	Site and route	Animals with tumors	Survival	Duration of experiment
714.--ESTRADIOL BENZOATE--Continued								
Pan and Gardner, 1948a	Mice	PM x C3H	F	Weekly injections (total dose 0.598 to 1.013 mg.)	S.C.	Tumors[337]	9 alive at 200 d.	356 d. or 433 d.
	Mice	PM x C3H	F	Weekly injections of 0.0166 - 1.275 mg.	S.C.	Tumors[338]	9 alive at 200 d.	391 d. or 433 d.
Silberberg and Silberberg, 1948	65 mice	C3H	M, castr.	0.03 mg. in sesame oil once weekly for 5 mos.	S.C.	Tumors[339]	58 alive at 9.7 mos.	At least 9.7 mos.
	58 mice	C3H	M	0.03 mg. in sesame oil once weekly for 5 mos.	S.C.	Tumors[340]	44 alive at 10.7 mos.	At least 10.7 mos.
Houssay and Higgins, 1949	38 mice	CBA and C	M&F	4.1 - 41.0 μg. in sesame oil, 3 times weekly, 34 - 39 d.	S.C.	0	----	49 d.
Kaufmann et al., 1949	34 mice	Bl-C	F	0.06% in sesame oil, 30 μg. weekly (0.05 ml.)	S.C.	6	----	----
	257 mice	Little db	F	0.06% in sesame oil, 30 μg. weekly (0.05 ml.)	S.C.	1[341]	----	23 mos.
	146 mice	BI-H	F	0.06% in sesame oil, 30 μg. weekly (0.05 ml.)	S.C.	0[342]	Alive at 10 mos.	35 mos.
Li and Gardner, 1949	13 mice[343]	A, C3H, C57, hybrids	M&F	16.6 μg. in oil weekly	S.C.	0	----	10 mos.
Silberberg and Silberberg, 1949	75 mice[344]	C3H	M	0.03 mg. in sesame oil once weekly for 5 mos. beginning at age of 4 mos.	S.C.	3[345]	Alive at 13.5 mos.	19 mos.
	66 mice[346]	C3H	M	0.03 mg. in sesame oil once weekly for 5 mos. beginning at age of 4 to 5 wks.	S.C.	10[345]	----	18 mos.
Fels, 1950a	15 rats	----	----	10 - 31 mg. (total dose)	S.C.	Tumors[347a]	----	68 - 216 d.
Fels, 1950b	15 rats[348]	----	M&F	10 - 31 mg. in 0.05 to 0.1 cc. sesame oil, 2 to 4 times per wk.	S.C.	5[347a]	----	----
Lu, 1950	10 mice	----	M	0.1 mg. in olive oil, 2 or 3 inj.	S.C.	0	3 killed at 60 d.	180 d.
Oberling et al., 1950	40 rats	----	M&F	0.1 or 0.2 ml. of a .001 or .005 soln. in oil weekly	S.C.	Tumors[350]	----	At least 9 mos.
Rodriguez and Martinez, 1950	Rats[351]	----	F	Daily injection, 15 μg. for 3 mos.	----	0	----	12 mos.
deGraaf, 1951	Rats	----	F, castr.	5 μg. per 0.1 ml. for 2 wks., treatment started 2 wks. after operation	S.C.	0[352]	----	----

[337] 8 cervical cancers, 2 mammary carcinomas, 3 lymphosarcomas, 1 carcinoma of vagina.
[338] 8 cervical cancers, 2 mammary carcinomas, 1 carcinoma of vagina and 4 lymphosarcomas.
[339] 20 mammary carcinomas.
[340] 4 mammary carcinomas.
[341] Mammary.
[342] Mammary, 49% (46% in the controls).
[343] Bearing intrasplenic ovarian grafts.
[344] 42 castrates.
[345] Lymphomas.
[346] 24 castrates.
[347a] Pituitary adenomas.
[348] Some castrates.
[350] 2 mammary fibroadenomas, 1 sarcoma, chromophobe adenomas of pituitary.
[351] 95% of the pancreas and both ovaries removed.
[352] Paper concerned with development of sebaceous gland.

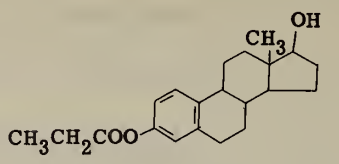
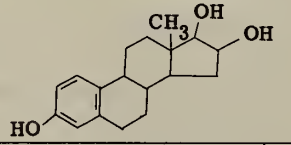
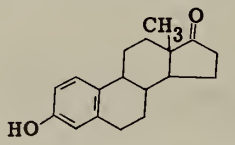
Reference	Animal	Strain or type	Sex	Preparation and dose	Site and route	Animals with tumors	Survival	Duration of experiment
714.--ESTRADIOL BENZOATE--Continued								
Moricard and Gothie, 1951	Guinea pigs	----	F	1 mg. per wk. for 8 - 19 wks.	S.C.	26[353]	----	8 wks. - 19 wks.
Robertson et al., 1951	Guinea pigs	----	M	0.5 mg. twice weekly; 50 mg. ascorbic acid supplement in some diets	S.C.	0	----	Over 4 wks.
Silberberg and Silberberg, 1951	63 mice	C3H	----	0.03 mg. once weekly for 5 mos.	----	Tumors[354]	----	Over 5 mos.
Ambrad-Dominguez and Cardeza, 1952	21 rats	White	F, castr.	10 μg. up to 258 d., daily injection	S.C.	0[355]	18 alive at 6 mos.	9 mos.
Pick et al., 1952	Chicks	Hyline	M	1 mg. daily	S.C.	0	Sacrificed at intervals	13 wks.
Braden and Peterson, 1953	23 guinea pigs[357]	----	F	5 μg. 3 times weekly in arachis oil (15 μg. per wk.)	I.M.	0[358]	----	28 wks.
Rennels et al., 1953	15 rats	Holtzman	M	15 μg. daily	S.C.	0	----	40 d.
Tuchmann-Duplessis and Levasseur, 1953	Rats[359]	Wistar	M&F	Increasing dose, 2 to 100 μg. for varying periods (8 to 60 d.)	S.C.	0[360]	----	60 d.

715.--ESTRADIOL DIPROPIONATE



Bruzzone et al., 1948	Guinea pigs	----	----	Pellet	Thoracic cavity	Tumors[360a]	----	126 d.
	Guinea pigs[360b]	----	----	Pellet	S.C.	100%[360c]	----	186 d.
Frantz and Kirschbaum, 1949	5 mice	NH	M&F, castr.	0.05 μg. in sesame oil	S.C.	5[361]	----	6 mos.
Kirschbaum et al., 1949	57 mice	CBA	----	5 μg. in peanut oil weekly for 14 wks.	S.C.	2[362]	----	500 d.
	59 mice	Bagg albino	----	5 μg. weekly for 14 wks. in peanut oil	S.C.	2[362]	----	500 d.
	84 mice	BALB/C	M	1 - 2 mg. cholesterol pellets	S.C.	47[363]	----	Over 400 d.

[353] Fibromyomas.
[354] Mammary.
[355] 16.6% with adrenal adenomas, also some pituitary adenomas. Untreated castrated controls had 37.5% adrenal adenomas.
[357] 7 castrates.
[358] Cystic glandular hyperplasia of the endometrium.
[359] Some castrates, some hypophysectomized, some normal.
[360] Hyperplasia of the adrenals.
[360a] Abdominal fibroids.
[360b] Part of diaphragm excised.
[360c] Abdominal fibroid and some in thoracic cavity.
[361] Adrenal cortical adenomas.
[362] Lymphomas.
[363] Leukemias and lymphosarcoma. Controls had 4% leukemia and no lymphosarcoma.

Reference	Animal	Strain or type	Sex	Preparation and dose	Site and route	Animals with tumors	Survival	Duration of experiment
716.--ESTRADIOL PROPIONATE 								
Bern, 1949	9 rabbits[364]	Dutch	M	4.6 - 34.9 mg. pellets; equivalent as dipropionate	S.C. right thigh	0[365]	----	633 d.
Kirschbaum et al., 1953	46 mice	CBA	M	1 - 2 mg. pellet in cholesterol	S.C.	Tumors[366]	----	Over 400 d.
717.--ESTRIOL 								
Takewaki, 1952	9 rats	----	M, castr.	0.64 to 0.16 mg. in sesame oil daily for 40 d.	S.C.	0	----	At least 40 d.
718.--ESTRONE 								
Herold and Effkemann, 1937	50 rats	----	F, normal and castr.	50 - 100 i.u. daily inj.	I.M.	0	----	14 d. - 3 mos.
	Mice	----	F, normal and castr.	50 - 500 i.u. daily inj.	----	0	----	2 - 3 mos.
Harsh et al., 1939	33 rats	----	M, normal and castr.	37.5 - 500 i.u. daily	S.C.	0	----	30 d.
	36 mice	----	M, normal and castr.	120 - 300 i.u. daily	S.C.	0	----	21 - 32 d.
Noble and Collip, 1941	Rats	Black-hooded	F	1-7 mg. pellets	S.C.	0 tumors[367]	----	At least 21 mos.
	Rats	----	M	Pellets	S.C.	0 tumors[368]	----	----
Moracci and Bracale, 1948	3 guinea pigs	----	F	1 to 5 mg. weekly for 1 to 4 mos.	I.M.	1[368a]	----	90 d.

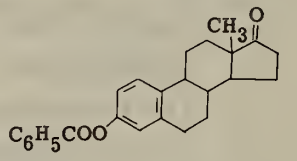
[364] 5 castrates.
[365] Seminal vesicle and prostate changes reported.
[366] 5 lymphomas. Controls had 40% leukemia and no lymphosarcoma.
[367] Mammary tumors (metastasis to lung in one rat), 2 pituitary adenomas.
[368] Mammary tumors.
[368a] Myofibroma

Reference	Animal	Strain or type	Sex	Preparation and dose	Site and route	Animals with tumors	Survival	Duration of experiment
718.--ESTRONE--Continued								
Dmochowsky and Orr, 1949	31 mice	C3H	M	0.02% soln. in alcohol twice weekly for 12 mos.	Skin	8[368]	----	At least 12 mos.
	28 mice	C57 black	M	0.02% soln. in alcohol twice weekly for 12 mos.	Skin	0	Avg. age at death 400 d.	At least 400 d.
	Mice	C57 black	F	0.02% soln. in alcohol twice weekly for 12 mos.	Skin	0	----	----
Kaufmann et al., 1949	325 mice	Bl-H	M&F	0.1 or 0.6% in sesame oil, 30 to 50 μg. weekly (0.05 ml.)	S.C.	223[369]	----	35 - 51 mos.
	14 mice	Bl-C	F	0.06% in sesame oil, 30 μg. weekly (0.05 ml.)	S.C.	3[369]	----	----
	127 mice	Bl-H	F	0.01% in chloroform weekly (ca 1/40 ml.)	Skin	85[369]	----	39 mos.
	43 mice	Bl-C	F	0.01% in chloroform weekly (ca 1/40 ml.)	Skin	4[369]	----	----
	150 mice	Little db	F	0.01% in chloroform weekly (ca 1/40 ml.)	Skin	73[369]	----	47 mos.
	138 mice	Little db	F	0.06% in sesame oil, 30 μg. weekly (0.05 ml.)	S.C.	70[369]	----	51 mos.
Krohn, 1949	7 monkeys	Macaca mulatta	F, castr.	10 μg. daily in arachis oil (total 7.282-20.499 mg.)	I.M.	0	----	1879 d.
Mühlbock, 1949	Mice	----	M&F, castr.	0.01-0.3 μg.	----	0	----	At least 3 mos.
Picco, 1949	28 rats	----	----	500 I.U. daily	S.C.	0	Killed at intervals	517 d.
Cardeza, 1950	Rats[370]	----	----	Daily injection for 6 mos.	----	Tumors[371]	----	6 mos.
Mühlbock, 1950	105 mice	dba	F, castr.	2 mg. tablet, containing progesterone also	S.C.	11-53%[372]	----	At least 10 mos.
	26 mice	dba	F	10%	----	16[372]	----	At least 15 mos.
	32 mice[373]	dba	F	5%	----	27[372]	----	At least 16 mos.
Baglioni, 1952	2 rats	Albino	M	100 mg. in 60 d.	----	0	2 alive	60 d.
Dunning et al., 1953	Rats	Copenhagen	M&F	One 8 - 10 mg. pellet (3.4 or 5.0 mg. absorbed)	S.C.	Tumors[374]	28 alive at 150 d.	At least 377 d.
	Rats	Copenhagen	M&F	Two 8 - 10 mg. pellets (7.7 or 9.3 mg. absorbed)	S.C.	Tumors[375]	57 alive at 150 d.	At least 412 d.
	Rats	AXC	M&F	One 8 - 10 mg. pellet (7.5 or 8.2 mg. absorbed)	S.C.	Tumors[374]	62 alive at 150 d.	At least 535 d.
	Rats	AXC	M&F	Two 8 - 10 mg. pellets (4.4 or 5.7 mg. absorbed)	S.C.	Tumors[374]	56 alive at 150 d.	At least 243 d.

[368] Mammary tumors.
[369] Mammary.
[370] Castrated and 95% of the pancreas removed.
[371] Tumors of the pancreas.
[372] Mammary cancer.
[373] With milk factor.
[374] Bladder carcinomas, adrenal tumors.
[375] Bladder carcinomas.

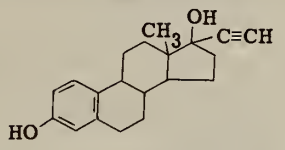
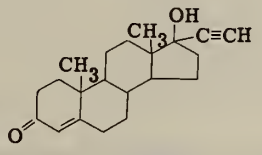
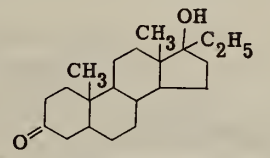
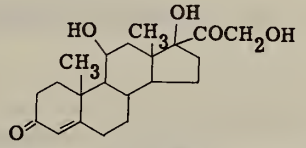
Reference	Animal	Strain or type	Sex	Preparation and dose	Site and route	Animals with tumors	Survival	Duration of experiment
718.--ESTRONE--Continued								
Dunning et al., 1953	Rats	August	F	One 8 - 10 mg. pellet (3.2 or 3.3 mg. absorbed)	S.C.	Tumors[376]	37 alive at 150 d.	At least 319 d.
	Rats	Fischer	M&F	One 8 - 10 mg. pellet (9.4 - 9.6 mg. absorbed)	S.C.	Tumors[377]	58 alive at 150 d.	At least 572 d.
	Rats	Fischer	M&F	Two 8 - 10 mg. pellets (3.5 - 5.1 mg. absorbed)	S.C.	Tumors[378]	46 alive at 150 d.	At least 194 d.

719.--ESTRONE BENZOATE

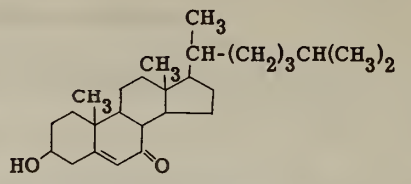
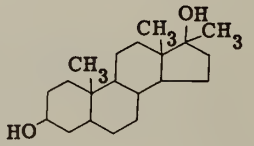
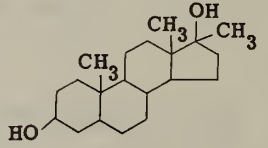


Lacassagne, 1936c	10 mice	----	----	300 i.u. weekly	S.C.	0 tumors[379]	----	At least 5 mos.
Lacassagne, 1936d	4 mice	R3	M&F	0.1% in oil, 0.05 cc. weekly	S.C.	0 tumors[380]	2 dead	At least 6 mos.
Kaufmann et al., 1949	36 mice	BI-C	F	0.1% in sesame oil, 50 μg. weekly, (0.05 ml.)	S.C.	10	----	----
	24 mice	BI-C	M	0.1% in sesame oil, 50 μg. weekly, (0.05 ml.)	S.C.	5	----	----
	71 mice	BI-C	F	0.2% in sesame oil, 100 μg. weekly, (0.05 ml.)	S.C.	2	----	----
	89 mice	BI-C	M	0.2% in sesame oil, 100 μg. weekly, (0.05 ml.)	----	2	----	----
	51 mice	BI-C	F	0.1% in benzene weekly, (ca 1/40 ml.)	Skin (back)	3	----	----
	60 mice	BI-C	M	0.1% in benzene weekly, (ca 1/40 ml.)	Skin (back)	1	----	----
	86 mice	Little db	F	0.06% in sesame oil, 30 μg. weekly, (0.05 ml.)	S.C.	0	----	31 mos.
	95 mice	Little db	M	0.06% in sesame oil, 30 μg. weekly, (0.05 ml.)	S.C.	6[381]	12 mos.	31 mos.
	116 mice	BI-H	F	0.002% in sesame oil, 1 μg. weekly, (0.05 ml.)	S.C.	70[381a]	16 mos.	47 mos.
	113 mice	BI-H	M	0.002% in sesame oil, 1 μg. weekly, (0.05 ml.)	S.C.	6[381b]	19 mos.	51 mos.
	165 mice	BI-H	F	0.06% in sesame oil, 30 μg. weekly, (0.05 ml.)	S.C.	84[381c]	10 mos.	27 mos.
	149 mice	BI-H	M	0.06% in sesame oil, 30 μg. weekly, (0.05 ml.)	S.C.	50[381d]	10 mos.	27 mos.
	70 mice	BI-H	F	0.1% in sesame oil, 50 μg. weekly, (0.05 ml.)	S.C.	43[381e]	10 mos.	27 mos.
	66 mice	BI-H	M	0.1% in sesame oil, 50 μg. weekly, (0.05 ml.)	S.C.	42[381f]	10 mos.	31 mos.
	50 mice	BI-H	F	0.2% in sesame oil, 100 μg. weekly, (0.05 ml.)	S.C.	22[381g]		
	79 mice	BI-H	M	0.2% in sesame oil, 100 μg. weekly, (0.05 ml.)	S.C.	28[381h]	9 mo.	27 mos.
	24 mice	BI-H	F	0.1% in sesame oil, 50 μg. weekly, (0.05 ml.)	S.C.	2[381j]	----	27 mos.
	19 mice	BI-H	M	0.1% in sesame oil, 50 μg. weekly, (0.05 ml.)	S.C.	4[381k]	----	31 mos.
	111 mice	BI-H	F	0.002% in sesame oil, 1 μg. weekly, (0.05 ml.)	S.C.	80[381m]	16 mo.	55 mos.
	136 mice	BI-H	M	0.002% in sesame oil, 1 μg. weekly, (0.05 ml.)	S.C.	9[381n]	19 mos.	55 mos.
	64 mice	BI-H	F	0.1% in benzene weekly, (ca 1/40 ml.)	Skin (back)	20[381o]	9 mos.	27 mos.
	39 mice	BI-H	M	0.1% in benzene weekly, (ca 1/40 ml.)	Skin (back)	15[381p]	9 mos.	27 mos.

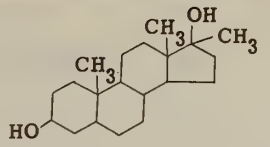
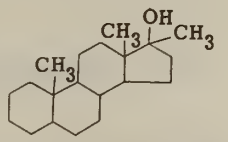
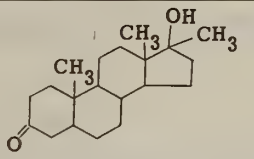
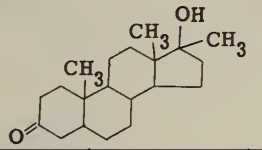
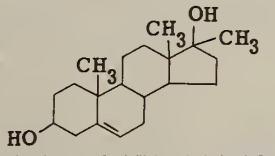
[376] Mammary carcinomas, bladder carcinomas, adrenal tumors.
[377] Mammary carcinomas, adrenal tumors.
[378] Mammary carcinomas, bladder carcinomas.
[379] 1 animal with an ovarian tumor and a tumor of the thymus; another with a uterine tumor.
[380] Mammary adenocarcinoma in 2 mates at 6 months.
[381] Mammary 6%.
[381a] Mammary 60% (46% in the controls).
[381b] Mammary 5% (controls 0).
[381c] Mammary 51% (46% in the controls).
[381d] Mammary 34% (controls 0).
[381e] Mammary 61% (46% in the controls).
[381f] Mammary 64%.
[381g] Mammary 37% (46% in the controls).
[381h] Mammary 35% (controls 0)
[381j] Mammary 8.3%.
[381k] Mammary 21%.
[381m] Mammary 72%.
[381n] Mammary 7%.
[381o] Mammary 45% (83% in the controls).
[381p] Mammary 38% (controls 0).

Reference	Animal	Strain or type	Sex	Preparation and dose	Site and route	Animals with tumors	Survival	Duration of experiment
719.--ESTRONE BENZOATE--Continued								
Takewaki, 1952	11 rats	----	M, castr.	.064 to .8 mg. in sesame oil for 40 d.	S.C.	0	----	40 d.
720.--ETHINYL ESTRADIOL 								
Cardeza, 1950	Rats[382]	----	----	Daily injection for 6 mos.	----	Tumors[382a]	----	6 mos.
Kirkman, 1952	Hamster	Golden	M	Pellets, 57 mg. absorbed in 345 d.	S.C.	27[383]	----	394 d. avg.
Kirkman and Bacon, 1952b	12 hamsters	Golden	M	Pellets	S.C.	0	----	350 d. avg.
721.--ETHINYL TESTOSTERONE 								
Cardeza, 1950	Rats[382]	----	----	Daily injection for 6 mos.	----	0	----	6 mos.
722.--17β-ETHYLDIHYDROTESTOSTERONE 								
Cardeza, 1950	Rats[382]	----	----	Daily injection for 6 mos.	----	0	----	6 mos.
723.--17-HYDROXYCORTICOSTERONE[384] 								
Castor and Baker, 1950	Rats	Long-Evans and Wistar	----	24 - 100 μg. in 0.1 cc. of 25% alcohol daily	Skin	0	----	180 d.
Hayes, 1953	6 rats	Long-Evans	M	0.1 cc. of a 1 mg. per cc. ethyl alcohol soln.	Skin	0	----	6 mos.

[382] Castrated and 95% of the pancreas removed.
[382a] No details.
[383] Hepatomas.
[384] Compound F.

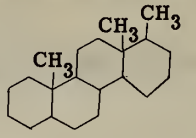
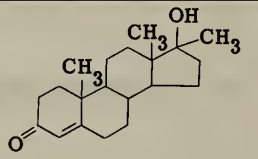
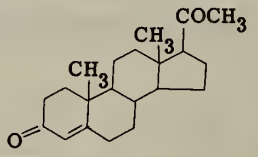
Reference	Animal	Strain or type	Sex	Preparation and dose	Site and route	Animals with tumors	Survival	Duration of experiment
724.--7-KETOCHOLESTEROL 								
Altschul and Spencer, 1952	33 rabbits	----	----	0.3 gm. per d. P.O. and 0.1 gm. per d. by skin painting	P.O. Skin	0[385]	Some died early	515 d.
	19 rats	White	----	----	P.O., S.C., Skin	0	Some died early	515 d.
	11 hamsters	----	----	----	P.O., S.C., Skin	0	Some died early	515 d.
	9 guinea pigs	----	----	----	P.O., S.C., Skin	0[386]	Some died early	515 d.
	10 mice	White	----	----	P.O., S.C., Skin	0	Some died early	515 d.
725.--17-METHYLANDROSTANEDIOL-3α, 17α 								
Humm et al., 1948	9 guinea pigs	----	M	Pellets, 1.9 - 9.5 mg. absorbed in 30 days, 35 d. after castration	S.C.	0[387a]	----	30 d.
Kochakian et al., 1949	10 guinea pigs	Albino English short-haired	M	1 and 6 pellets (1.9 - 9.5 mg. absorbed in 30 d.), 35 d. after castration.	S.C.	0	----	30 d.
726.--17-METHYLANDROSTANE-3α, 17β-DIOL 								
Kochakian, 1952	Mice	White	M, castr.	1 or 5 mg. per gm. diet for 30 d.	P.O.	0	----	30 d.

[385] In 7 rabbits hyperplastic lesion of renal tubules with neoplastic features.
[386] 3 animals had hyperplastic lesions of renal tubules with neoplastic features.
[387a] Pathology not reported.

Reference	Animal	Strain or type	Sex	Preparation and dose	Site and route	Animals with tumors	Survival	Duration of experiment
727. --17-METHYLANDROSTANE-3β, 17β-DIOL 								
Kochakian, 1952	Mice	White	M, castr.	1 or 5 mg. per gm. diet for 30 d.	P.O.	0	----	30 d.
728. --17-METHYLANDROSTAN-17β-OL 								
Kochakian, 1952	Mice	White	M, castr.	0.2 or 1.0 mg. per gm. diet for 30 d.	P.O.	0	----	30 d.
729. --17-METHYLANDROSTANOL-17α-ONE-3 								
Humm et al., 1948	10 guinea pigs	----	M	Pellets, 1.8 - 4.4 mg. absorbed in 30 d., 35 d. after castration	S.C.	0[387a]	----	30 d.
Kochakian et al., 1949	10 guinea pigs	Albino English short-haired	M	1 or 3 pellets (1.5 - 4.4 mg. absorbed in 30 d.), 35 d. after castration	S.C.	0	----	30 d.
730. --17-METHYLANDROSTAN-17β-OL-3-ONE 								
Kochakian, 1952	Mice	White	M, castr.	1 or 5 mg. per gm. diet for 30 d.	P.O.	0	----	30 d.
731. --17α-METHYL-Δ^5-ANDROSTENE-3β,17β-DIOL[386a] 								
Gordan et al., 1951	18 rats	Long-Evans	M, castr.	1 mg. or 50 mg. per kg. daily for 1 wk.	S.C.	0	----	30 d.
Kochakian, 1952	Mice	White	M, castr.	1 or 5 mg. per gm. diet for 30 d.	P.O.	0	----	30 d.

[386a] Formerly called 17-methyl Δ^5-androstenediol-3β, 17α (in the 2nd Edition), 17 β-methyl Δ^5-androstene-3β, 17α-diol, and methyltransandrostenediol.

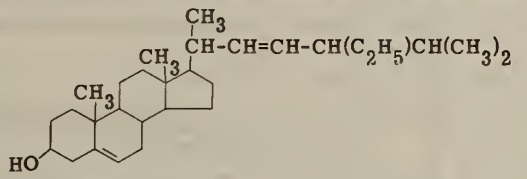
[387a] Pathology not reported.

Reference	Animal	Strain or type	Sex	Preparation and dose	Site and route	Animals with tumors	Survival	Duration of experiment
732. --17α-METHYL-D-HOMOANDROSTANE 								
Gough and Shoppee, 1952	Mice	----	----	0.5% in benzene repeatedly	Skin	0	----	----
733. --17-METHYLTESTOSTERONE 								
Humm et al., 1948	15 guinea pigs	English albino short-haired	M	Pellets, 6.8 - 28.3 mg. absorbed in 30 d., 35 d. after castration	S.C.	0[387a]	----	30 d.
Kochakian et al., 1949	15 guinea pigs	Albino English short-haired	M	1, 3 and 5 pellets (6.8 - 28.3 mg. absorbed in 30 d., 35 d. after castration	S.C.	0	----	30 d.
Lewis et al., 1949	4 rats	Albino	F	5 mg. in sesame oil, daily injections	S.C.	0	----	40 d.
Cardeza, 1950	Rats[382]	----	----	Daily injection for 6 mos.	S.C.	0	----	6 mos.
Gordan et al., 1951	12 rats	Long-Evans	M, castr.	1 mg. per kg. daily for 1 wk.	S.C.	0	----	30 d.
Kochakian, 1952	Mice	White	M, castr.	1 mg. per gm. diet for 5 mg. per gm. diet for 30 d.	P.O.	0	----	30 d.
Light and Tornaben, 1953a	5 rats	Carworth	M	200 mg. of ointment containing 400 μg. daily; Oreton ointment	Skin	----	----	201 d.
734. --PROGESTERONE 								
Symeonidis, 1948	6 mice	----	F	0.5 - 2 mg. every other day for the last 10 d. of pregnancy (total dose 4 - 15 mg.)	S.C.	2[387]	4 alive	At least 145 d.
	16 mice	----	F	2 - 5 mg. dose (total dose 8 - 25 mg.)	S.C.	3[387]	10 alive at 127 d.	At least 127 d.
Atkinson et al., 1949	9 rats	Sherman	F, castr.	4 mg. in 0.2 cc. sesame oil weekly, also on vitamin E deficient diet	S.C.	0	Sacrificed at 5 - 10 mos.	10 mos.

[382] Castrated and 95% of the pancreas removed.
[387] Mammary carcinomas.
[387a] Pathology not reported.

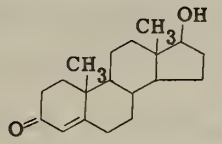
Reference	Animal	Strain or type	Sex	Preparation and dose	Site and route	Animals with tumors	Survival	Duration of experiment
734.--PROGESTERONE--Continued								
Kar, 1949	12 Pigeons	Indian Rock	----	0.5 mg. in 0.1 cc. sesame oil daily	I.M.	0	----	30 d.
Lewis et al., 1949	3 rats	Albino	F	2.5 mg. in sesame oil, daily inj.	----	0	----	40 d.
Li and Gardner, 1949	Mice[388]	C3H, A, C57, hybrids	M&F	1 mg. in oil weekly	S.C.	Tumors[389]	----	10 mos.
Cardeza, 1950	Rats[382]	----	----	Daily injection for 6 mos.	S.C.	0	----	6 mos.
Mühlbock, 1950a	15 mice	dba	F	----	----	8[390]	----	Over 14 mos.
Trentin, 1950	27 mice	CBA x AF_1 hybrids	M	14 mg. pellet every 28 d.	S.C.	0[387a]	24 alive at 15.5 mos.	15.5 mos.
	90 mice	C3H x AF_1 hybrids	M&F	14 mg. pellet every 28 d.	S.C.	0	31 alive at 15.5 mos.	15.5 mos.
Bergstrand, 1952	4 rabbits	----	M&F	2.5 - 10 mg. in arachis oil 3 times weekly	S.C.	0	----	33 d.
Graffi and Gummel, 1952	100 mice	----	----	0.5% soln. in acetone for 4 or 8 wks., plus croton oil, 5% soln. in paraffin oil, once weekly	Skin	Pap.	38 alive at 6 mos.	1 yr.
Combescot and Riviere, 1953	1 monkey	Algerian	F, castr.	2 x 100 mg. pellets	S.C.	0	----	9 mos.

735.--STIGMASTEROL



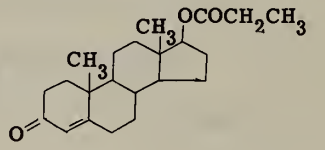
Altschul, 1948	Rabbits	----	----	0.3 gm. daily, 73 to 116 d.	P.O.	0[387a]	----	116 d.

736.--TESTOSTERONE



Humm et al., 1948	15 guinea pigs	----	M	Pellets, 7.4 - 32.3 mg. absorbed in 30 d., 35 d. after castration	S.C.	0[390a]	----	30 d.
Grad and Leblond, 1949	10 rats[391]	----	M	0.25 mg. per 1 cc. saline twice daily	S.C.	0	----	47 d.
Kochakian et al., 1949	15 guinea pigs	Albino English short-haired	M	1, 3 and 5 pellets (7.4 - 32.2 mg. absorbed in 30 d.), 35 d. after castration	S.C.	0	----	30 d.
Cardeza, 1950	Rats[392]	----	----	Daily injection for 6 mos.	----	0	----	6 mos.

[382] Castrated and 95% of the pancreas removed.
[387a] Pathology not reported.
[388] Bearing intrasplenic ovarian grafts.
[389] 8 granulosa cell tumors, 1 luteoma, 1 mixed tumor of ovary, in grafts.
[390] Mammary cancer.
[390a] Pathology not reported.
[391] Thyroidectomized and castrated.
[392] Castrated and 95% of the pancreas removed.

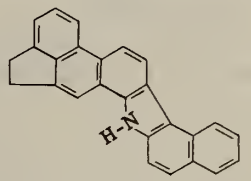
Reference	Animal	Strain or type	Sex	Preparation and dose	Site and route	Animals with tumors	Survival	Duration of experiment
736.--TESTOSTERONE--Continued								
Hoyt et al., 1950	4 chicks	----	M&F	5 mg. per day applications	Comb	0	----	77 d.
Duran-Reynals, 1952	42 chickens	Plymouth Rock	----	12 or 24 mg.	S.C.	0	----	----
Graffi and Gummel, 1952	100 mice	----	----	0.5% soln. in acetone for 4 or 8 wks., plus croton oil, 5% soln. in paraffin oil, once weekly	Skin	Pap.	32 alive at 6 mos.	1 yr.
Kochakian, 1952	Mice	White	M, castr.	1 or 5 mg. per gm. diet for 30 d.	P.O.	0	----	30 d.
Combescot and Riviere, 1953	1 monkey	Algerian	----	3 x 100 mg. pellets	S.C.	0	----	15 mos.
Hayes, 1953	6 rats	Long-evans	M	0.1 cc. of a 1 mg. per cc. ethyl alcohol soln.	Skin	0	----	6 mos.
737.--TESTOSTERONE PROPIONATE 								
Bulliard and Ravina, 1938	Ducks	Barbary	M&F	10 mg. 3 times weekly in pectoral muscles	S.C.	0	----	More than 4 wks.
Silberberg and Silberberg, 1941b	36 mice	C57, D, AKA	F	0.25 or 0.75 mg. weekly	S.C.	0	----	2 wks. - 19 mos.
Humm et al., 1948	10 guinea pigs	----	M	Pellets, 7.5 or 20.5 mg. absorbed in 30 d., 35 d. after castration	S.C.	0[390a]	----	30 d., 90 d.
Kochakian and Stettner, 1948	16 mice	Swiss	M, castr.	Pellets, 14 mg. (approx. equivalent to 0.15 mg. per d.), with or without growth hormone	S.C.	0	----	34 d.
Frantz and Kirschbaum, 1949	2 mice	NH	F	17.5 μg. in oil weekly	S.C.	2[393]	----	5.5 mos.
Houssay and Higgins, 1949	39 mice	CBA and C	M&F	50 - 250 μg. in sesame oil, 5 times weekly, 34 - 51 d.	S.C.	0	----	51 d.
Kochakian et al., 1949	11 guinea pigs	Albino English short-haired	M	1 and 3 pellets (4.0 - 7.5 mg. absorbed)	S.C.	0	----	90 d.
Li and Gardner, 1949	14 mice[394]	A, C57, C3H, hybrids	M&F	1.25 mg. in oil weekly	S.C.	0	----	10 mos.
Meyer, 1949	573 rats	Wistar	M	2 - 2000 μg. in 0.1 sesame oil every 48 hrs.	S.C.	0	Killed at intervals	120 d. - 176 d.
Montagne et al., 1949	4 rabbits	----	M&F	0.1 cc. of a 1% soln. in olive oil on alternate days for 1 mo.	Skin	0[395]	----	1 mo.
van Wagenen, 1949	2 monkeys	Macaca mulatta	F	7.5 mg. per kg. per wk.	I.M.	0[390a]	----	1 yr.
Bergstrand, 1950	17 rabbits	----	----	5 mg. 3 times weekly in arachis oil	S.C.	0	----	67 d.

[390a] Pathology not reported.
[393] Adrenal cortical adenomas.
[394] Bearing intrasplenic grafts.
[395] Mitosis studied.

Reference	Animal	Strain or type	Sex	Preparation and dose	Site and route	Animals with tumors	Survival	Duration of experiment
737.--TESTOSTERONE PROPIONATE--Continued								
Fels, 1950a	10 rats	----	M&F	255 mg. or 305 mg. (total dose) in 164 or 222 d.	S.C.	0	----	164 or 222 d.
DeBias, 1951	6 rats[396]	Wistar	F	3 mg. in 0.12 cc. sesame oil daily	I.M.	0	----	7 wks.
Van Bekkum and Kassenaar, 1951	29 mice	Brofo M.A.O.	F, castr.	2.5 mg. in olive oil 2 times weekly	S.C.	0	----	50 d.
Bergstrand, 1952	42 rabbits[397]	----	M&F	5 mg. in arachis oil, 3 times weekly	S.C.	0	----	At least 39 d.
Horning, 1952	Mice	A, C3H	M	Powder and prostate tissue graft	S.C.	0	----	6 wks.
Scow, 1952	22 rats[398]	Holtzman	M	0.1 mg. per 100 gm. for 28 d. and then 0.5 mg. per 100 gm. for 28 d. in sesame oil	S.C.	0	----	56 d.
Takewaki, 1952	14 rats	----	M, castr.	.015 to 0.25 mg. in sesame oil, daily for 40 d.	S.C.	0	----	40 d.
Bruzzone and Lipschütz, 1953	14 guinea pigs	----	F, castr.	0.238% in oil, 0.2 ml. weekly, 3 times	S.C.	0	----	4 mos.
Light and Tornaben, 1953b	5 rats	Carworth	F	Ointment	Skin	0	----	186 d.
Rennels et al., 1953	15 rats	Holtzman	M	2.5 mg. daily	S.C.	0	----	40 d.

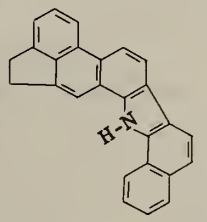
B--ORGANIC COMPOUNDS 9.--HETEROCYCLIC

738.--1,2,2',3'-ACENAPHTHENO-5,6-BENZCARBAZOLE



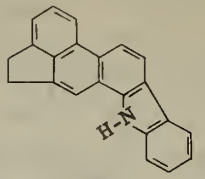
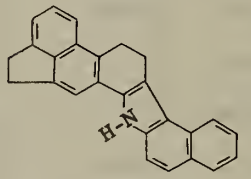
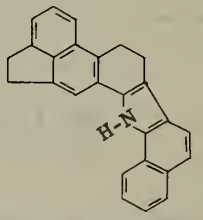
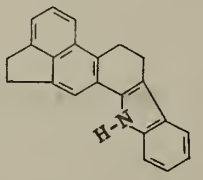
Lacassagne et al., 1955	30 mice	XVII	----	1 mg. in peanut oil, 3 injections at monthly intervals	S.C.	0	8 alive at 200 d.	390 d.

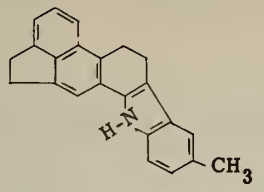
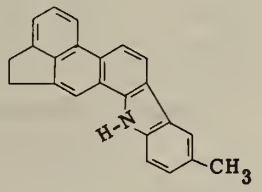
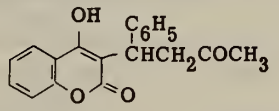
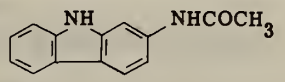
739.--1,2,2',3'-ACENAPHTHENO-7,8-BENZCARBAZOLE



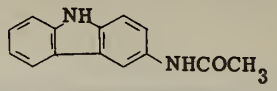
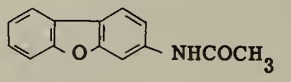
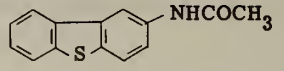
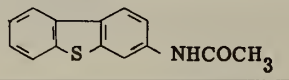
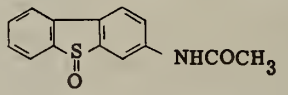
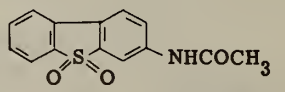
Lacassagne et al., 1955	10 mice	XVII	----	1 mg. in peanut oil, 3 injections at monthly intervals	S.C.	0	6 alive at 225 d.	305 d.

[396] With thyroidectomy and ovariectomy in many cases.
[397] 34 infantile, 8 adults.
[398] Some gonadectomized, some thyroidectomized and some hypophysectomized.

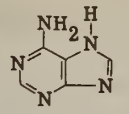
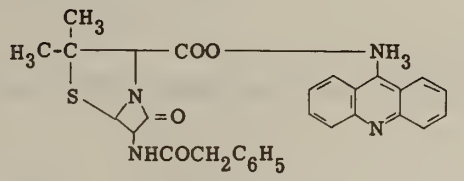
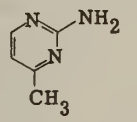
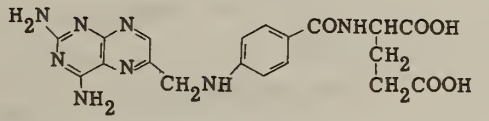
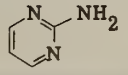
Reference	Animal	Strain or type	Sex	Preparation and dose	Site and route	Animals with tumors	Survival	Duration of experiment
740.--1,2,2',3'-ACENAPHTHENOCARBAZOLE 								
Lacassagne et al., 1955	30 mice	XVII	----	1 mg. in peanut oil, 3 injections at monthly intervals	S.C.	0	12 alive at 315 d.	450 d.
741.--1,2,2',3'-ACENAPHTHENO-3,4-DIHYDRO-5,6-BENZCARBAZOLE 								
Lacassagne et al., 1955	30 mice	XVII	----	1 mg. in peanut oil, 3 injections at monthly intervals	S.C.	0	8 alive at 325 d.	530 d.
742.--1,2,2',3'-ACENAPHTHENO-3,4-DIHYDRO-7,8-BENZCARBAZOLE 								
Lacassagne et al., 1955	26 mice	XVII	----	1 mg. in peanut oil, 3 injections at monthly intervals	S.C.	0	8 alive at 255 d.	420 d.
743.--1,2,2',3'-ACENAPHTHENO-3,4-DIHYDROCARBAZOLE 								
Lacassagne et al., 1955	10 mice	XVII	----	1 mg. in peanut oil, 3 injections at monthly intervals	S.C.	0	3 alive at 230 d.	230 d.

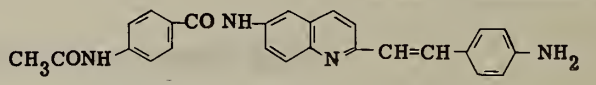
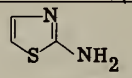
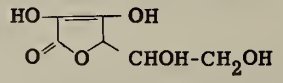
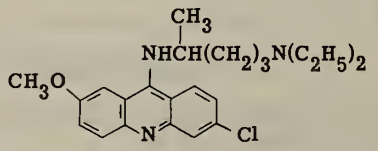
Reference	Animal	Strain or type	Sex	Preparation and dose	Site and route	Animals with tumors	Survival	Duration of experiment
744. --1,2,2',3'-ACENAPHTHENO-3,4-DIHYDRO-6-METHYLCARBAZOLE 								
Lacassagne et al., 1955	10 mice	XVII	----	1 mg. in peanut oil, 3 injections at monthly intervals	S.C.	0	7 alive at 200 d.	315 d.
745. --1,2,2',3'-ACENAPHTHENO-6-METHYLCARBAZOLE 								
Lacassagne et al., 1955	20 mice	XVII	----	1 mg. in peanut oil, 3 injections at monthly intervals	S.C.	0	5 alive at 195 d.	300 d.
746. --3-(ACETONYLBENZYL)-4-HYDROXYCOUMARIN 								
Hagan and Radomski, 1953	5 chickens	----	----	100 p.p.m. for 50 d. and then 500 p.p.m. for 56 d.	P.O.	0	2 died at 60 d.	106 d.
	5 chickens	----	----	25 p.p.m. for 51 d. and then 1000 p.p.m. for 52 d.	P.O.	0	4 died at 79 d.	103 d.
	5 chickens	----	----	200 p.p.m. in the diet for 106 d.	P.O.	0	2 died at 14 d.	106 d.
	11 dogs	----	M&F	10 - 50 p.p.m. in the diet for 34 - 220 d.	P.O.	0	----	34 d. - 220 d.
747. --2-ACETYLAMINOCARBAZOLE 								
Miller et al., 1955	25 rats	Holtzman	M&F	1.62 m.mols per kg. of diet for 8 mos.	P.O.	Tumors[399]	----	At least 8 mos.

[399] 2 mammary gland adenocarcinomas at 10 months. (None in the controls)

Reference	Animal	Strain or type	Sex	Preparation and dose	Site and route	Animals with tumors	Survival	Duration of experiment
748. --3-ACETYLAMINOCARBAZOLE 								
Miller et al., 1955	18 rats	Holtzman	M&F	1.62 m.mols per kg. of diet for 8 mos.	P.O.	0	----	At least 8 mos.
749. --3-ACETYLAMINODIBENZOFURAN 								
Miller et al., 1949	14 rats	Albino	M&F	0.037% in the diet for 8 mos.	P.O.	Tumors[400]	13 alive at 4 mos.	8 mos.
750. --2-ACETYLAMINODIBENZOTHIOPHENE 								
Miller et al., 1955	17 rats	Holtzman	M&F	1.62 m.mols per kg. of diet for 8 mos.	P.O.	Tumors[401]	----	At least 8 mos.
751. --3-ACETYLAMINODIBENZOTHIOPHENE 								
Miller et al., 1949	32 rats	Albino	M&F	0.039 or 0.043% in the diet for 6.5 or 8 mos.	P.O.	Tumors[402]	At least 9 died at 5 mos.	8 mos.
MacDonald et al., 1952	15 rats	Albino	M	0.025% in the diet for 90 d.	P.O.	Tumors[403]	14 alive at 130 d.	220 d.
752. --3-ACETYLAMINODIBENZOTHIOPHENE-5-OXIDE 								
Miller et al., 1949	14 rats	Albino	M&F	0.042% in the diet for 8 mos.	P.O.	Tumors[404]	14 alive at 4 mos.	8 mos.
753. --3-ACETYLAMINODIBENZOTHIOPHENE SULFONE 								
Miller et al., 1955	17 rats	Holtzman	M&F	1.62 m.mols per kg. of diet for 8 mos.	P.O.	0	1 neg. death at 8 mos.	At least 8 mos.

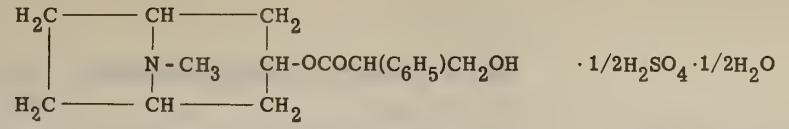
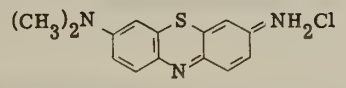
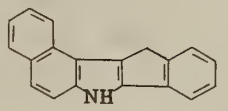
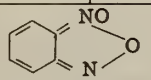
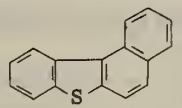
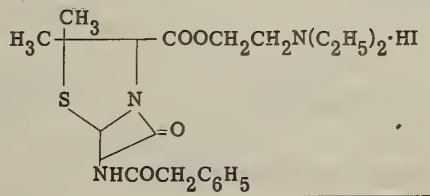
[400] 5 mammary carcinomas, 3 ear duct tumors.
[401] Mammary gland tumors, ear duct tumors, 2 small intestinal tumors.
[402] 9 mammary carcinomas, 9 ear duct tumors.
[403] 3 ear duct, 3 small intestine, 1 fibrosarcoma.
[404] 1 mammary carcinoma, 2 ear duct tumors.

Reference	Animal	Strain or type	Sex	Preparation and dose	Site and route	Animals with tumors	Survival	Duration of experiment
754. --ADENINE 								
Philips et al., 1952	16 rats	Wistar	M&F	0.1 and 0.2% of the diet increased to 0.5 and 1.0%	P.O.	0	----	51 d.
	6 rats	Wistar	M&F	50 - 100 mg. per kg. per d., 8 - 12 injections	I.P.	0	1 alive at 35 d.	35 d.
755. --9-AMINOACRIDINE PENICILLIN 								
Brodie and Lowenhaupt, 1949	30 mice	----	M&F	125 mg. per kg. in propylene glycol at 3 to 6 d. intervals	S.C.	0	----	30 d.
756. --2-AMINO-4-METHYLPYRIMIDINE 								
Treon et al., 1948	3 rabbits	----	----	0.127 gm. per kg. daily for 50 d.	P.O.	0	----	----
757. --AMINOPTERIN 								
Philips and Thiersch, 1949	Rats	Wistar	M&F	0.25 or 0.125 mg. per kg. per day	I.P.	0	----	56 d.
Boyland and Sargent, 1951	8 mice	B	----	0.5 mg. per ml. in water, 0.05 ml. of soln. in 8 sites	Intradermal	0	----	----
758. --2-AMINOPYRIMIDINE 								
Treon et al., 1948	2 rabbits	----	----	0.07 mg. per litre as vapor in air, 7 hrs. daily for 60 d.	Inhalation	0	100%	175 d.
	2 guinea pigs	----	----	0.07 mg. per litre as vapor in air, 7 hrs. daily for 60 d.	Inhalation	0	100%	175 d.

Reference	Animal	Strain or type	Sex	Preparation and dose	Site and route	Animals with tumors	Survival	Duration of experiment
758.--2-AMINOPYRIMIDINE--Continued								
Treon et al., 1948	2 rats	----	----	0.07 mg. per litre as vapor in air, 7 hrs. per d. for 60 d.	Inhalation	0	100%	175 d.
	2 rabbits	----	----	0.2 - 0.4 mg. per litre as dust in air, 7 hrs. daily, 15 exposures	Inhalation	0	100%	12 wks.
	2 guinea pigs	----	----	0.2 - 0.4 mg. per litre as dust in air, 7 hrs. daily, 15 exposures	Inhalation	0	100%	12 wks.
	2 rats	----	----	0.2 - 0.4 mg. per litre as dust in air, 7 hrs. daily, 15 exposures	Inhalation	0	100%	12 wks.
	3 rabbits	----	----	0.08 gm. per kg. daily for 50 d.	P.O.	0	----	58 d.
759.--2-(p-AMINOSTYRYL)-6-(p-ACETAMIDOBENZAMIDO)-QUINOLINE 								
Ibanez and Cepero, 1948	20 mice	White	----	1 ml. of a 1% saline soln.	S.C.	1 sarc.[405]	----	Over 1 yr.
760.--2-AMINOTHIAZOLE 								
Gyorgy et al., 1948	15 rats	----	M	0.05% in the diet	P.O.	0	2 died	150 d.
Spampinato, 1950b	20 mice	Albino	----	1 mg. daily	S.C.	0	----	166 d.
Tinacci and Ignesti, 1951	10 guinea pigs	----	----	5% soln. buffered with NaOH at pH 7, increasing doses from 0.5 to 5 ml. within 3 or 4 mos., every other day	S.C.	0	----	4 mos
	4 rats	----	----	5% soln. buffered with NaOH at pH 7, increasing doses from 0.5 to 5 ml. within 3 or 4 mos., every other day	S.C.	0	----	4 mos.
Combescot and Riviere, 1953	2 monkeys	Algerian	----	13 gm. and 23 gm.	----	0	----	----
761.--ASCORBIC ACID 								
Boyland and Sargent, 1951	17 mice	B, C57	----	0.01 and 0.1 molar in aqueous soln., 0.05 ml. in 8 or 18 sites	Intradermal	0	----	At least 40 d.
762.--ATABRINE 								
Rondoni (unpub. data)	Rats	Albino stock	M	10 mg., as the dihydrochloride dihydrate, in 1 ml. fat per animal, 3 injections	S.C.	1[406]	----	1 yr.

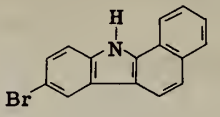
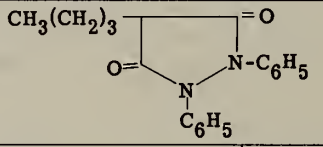
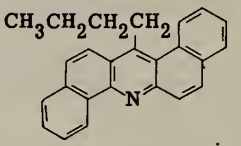
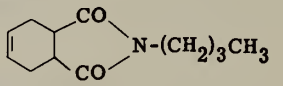
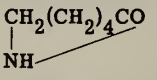
[405] At 7 months, transplanted.

[406] Fibrosarcoma.

Reference	Animal	Strain or type	Sex	Preparation and dose	Site and route	Animals with tumors	Survival	Duration of experiment
763. --ATROPINE SULPHATE 								
Ezeyza, 1952b	27 rats	----	M&F	4 mg. in 0.4 cc. of olive oil (total dose about 90 mg.), some upward variation in first to last injection.	S.C.	0[407]	4 alive at 20 mos.	20 mos.
764. --AZURE A 								
Haley and Stolarsky, 1951	3 rabbits	Dutch	F	1.9 mg. per kg. in saline, twice weekly	I.V.	0	----	90 d.
765. --4,5-BENZO-2,3,1',2'-INDENOINDOLE 								
Lacassagne et al., 1955	15 mice	XVII	----	1 mg. in peanut oil, 3 injections at monthly intervals	S.C.	1 sarc.	5 alive at 190 d.	295 d.
766. --o-BENZOQUINONE FUROXAN 								
Forni and Tappi, 1950	20 rats	Albino	----	1% benzene soln. for 240 d.	Skin	0	----	350 d.
767. --3,4-BENZO-9-THIAFLUORENE[408] 								
Ranadive (unpub. data)	12 mice	Swiss	F	.002 mg. in 0.2 ml. of tricaprylin per animal, one injection	S.C.	0	8 alive at 15 mos.	15 mos.
	12 mice	Swiss	F	0.5% in benzene twice a week, 127 paintings	Skin	0	8 alive at 15 mos.	15 mos.
768. --BENZYLPENICILLIN-β-DIETHYLAMINOETHYL ESTER HYDRIODIDE 								
Engelbreth-Holm and Roholt, 1953	20 rats	----	----	200 mg. in saline daily	S.C.	0	100%	7 wks.

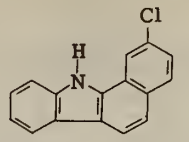
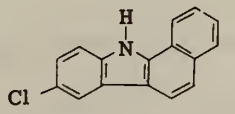
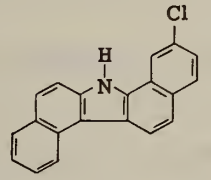
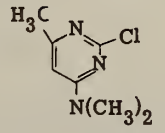
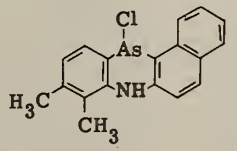
[407] 1 sarcoma far from injection site, thought to be spontaneous.

[408] Compound synthesized by Rabindran and Tilak, Proc. Indian Acad. Sci., 37 A, 564, 1953.

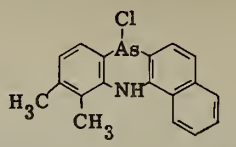
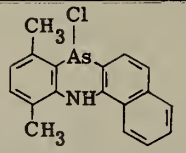
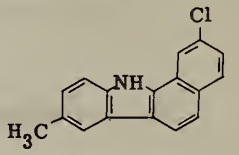
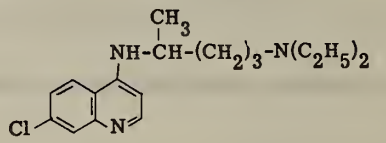
Reference	Animal	Strain or type	Sex	Preparation and dose	Site and route	Animals with tumors	Survival	Duration of experiment
769. --6-BROMO-1,2-BENZCARBAZOLE 								
Lacassagne et al., 1955	10 mice	XVII	----	1 mg. in peanut oil, 3 injections at monthly intervals	S.C.	0	4 alive at 210 d.	650 d.
770. --BUTAZOLIDINE[409] 								
Hazelton et al., 1953	3 dogs	----	----	10 - 250 mg. per kg. per d. in capsules	P.O.	0	1 died at 12 wks.	90 d.
	60 rats	Albino	M&F	0.1 - 1.0% in the diet	P.O.	0	100% survival	90 d.
771. --10-n-BUTYL-1,2,5,6-DIBENZACRIDINE 								
Zajdela and Buu-Hoi, 1950b	Mice	----	----	----	S.C.	Sarc.	----	----
772. --N-BUTYL-1,2,3,6-TETRAHYDROPHTHALIMIDE[410] 								
Draize et al., 1948	80 mice	----	----	Undiluted, daily	Skin	0	----	90 d.
	100 rats	----	----	Undiluted, daily	Skin	0	----	90 d.
773. --CAPROLACTAM 								
Ceresa and Grazioli, 1952	8 guinea pigs	----	----	Increasing doses, 5 mg. for 40 d., 10 mg. for 30 d., 50 mg. for 60 d.	S.C.	0	----	160 d.

[409] 3, 5-Dioxo-1,2-diphenyl-4-n-butylpyrazolidine.

[410] Erroneously named N-butyl 1,2,3,6-tetrahydronaphthalimide in original paper.

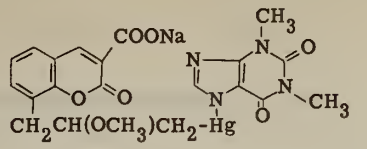
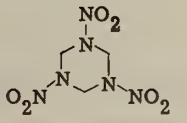
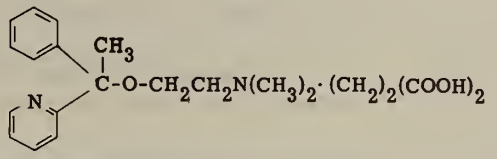
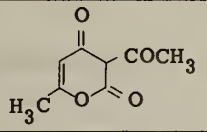
Reference	Animal	Strain or type	Sex	Preparation and dose	Site and route	Animals with tumors	Survival	Duration of experiment
774. --2'-CHLORO-1,2-BENZCARBAZOLE 								
Lacassagne et al., 1955	10 mice	CD	----	1 mg. in peanut oil, 3 injections at monthly intervals	S.C.	0	9 alive at 190 d.	390 d.
	10 mice	XVII	----	1 mg. in peanut oil, 3 injections at monthly intervals	S.C.	0	6 alive at 140 d.	185 d.
775. --6-CHLORO-1,2-BENZCARBAZOLE 								
Lacassagne et al., 1955	10 mice	XVII	----	1 mg. in peanut oil, 3 injections at monthly intervals	S.C.	0	6 alive at 240 d.	345 d.
776. --2'-CHLORO-1,2,5,6-DIBENZCARBAZOLE 								
Lacassagne et al., 1955	10 mice	CD	----	1 mg. in peanut oil, 3 injections at monthly intervals	S.C.	0	5 alive at 465 d.	475 d.
777. --2-CHLORO-4-DIMETHYLAMINO-6-METHYLPYRIMIDINE[411] 								
Crampton and Voss, 1952	8 rats	----	----	50 mg. per liter in drinking water	P.O.	0	High mortality	7 wks.
	14 rats	Albino	F	35 mg. per liter in drinking water	P.O.	0	100% survival	30 d.
778. --10-CHLORO-6,7-DIMETHYL-5,10-DIHYDRO-1,2-BENZOPHENARSAZINE 								
Lacassagne et al., 1951	10 mice	----	----	0.3% in acetone, 2 drops per wk. for 180 d.	Skin	0	5 alive at 200 d.	At least 200 d.

[411] Castrix.

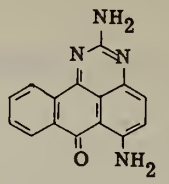
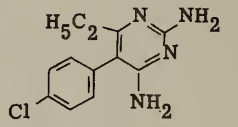
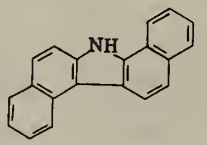
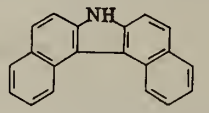
Reference	Animal	Strain or type	Sex	Preparation and dose	Site and route	Animals with tumors	Survival	Duration of experiment
779. --10-CHLORO-6,7-DIMETHYL-5,10-DIHYDRO-3,4-BENZOPHENARSAZINE 								
Lacassagne et al., 1951	10 mice	----	----	0.3% in acetone, 2 drops per wk. for 180 d.	Skin	0	4 alive at 278 d.	1 yr.
780. --10-CHLORO-6,9-DIMETHYL-5,10-DIHYDRO-3,4-BENZOPHENARSAZINE 								
Lacassagne et al., 1951	10 mice	----	----	0.3% in acetone, 2 drops per wk. for 180 d.	Skin	4 pap.	8 alive for 118 d.	----
781. --2'-CHLORO-6-METHYL-1,2-BENZCARBAZOLE 								
Lacassagne et al., 1955	20 mice	XVII	----	1 mg. in peanut oil, 3 injections at monthly intervals	S.C.	0	6 alive at 280 d.	480 d.
782. --CHLOROQUINE[412] 								
Nelson and Fitzhugh, 1948	100 rats	Osborne-Mendel	M&F	100 - 1000 p.p.m. in the diet	P.O.	0		2 yrs.
Fitzhugh et al., 1948b	100 rats	Osborne-Mendel	M&F	100 - 1000 p.p.m. in the diet	P.O.	0	29 alive at 18 mos.	24 mos.
Schmidt et al., 1953b	30 rats	----	----	0.0125 - 0.05% in the diet	P.O.	0	100% survival	6 wks.
783. --COBALT HISTIDINE COMPLEX[412a]								
Orten and Bucciero, 1948	15 rats	Albino	M	Equivalent of 0.5 mg. of cobalt daily	S.C.	0	----	10 wks.

[412] 7-Chloro-4-(4-diethylamino-1-methylbutylamino)-quinoline.

[412a] 1 Co: 2 histidine, according to L. Michaelis, Arch. biochem. 14:17-21 (1947).

Reference	Animal	Strain or type	Sex	Preparation and dose	Site and route	Animals with tumors	Survival	Duration of experiment
784. --CUMERTILIN[413] 								
Blumberg et al., 1952	11 rabbits	New Zealand Albino	----	2.6 - 7.8 mg. Hg. per kg. daily	I.M.	0	100%	6 mos.
	8 rabbits	New Zealand Albino	----	5 or 10 mg. Hg. per kg. twice weekly	I.M.	0	100%	2 mos.
785. --CYCLOTRIMETHYLENETRINITRAMINE 								
von Oettingen et al., 1949	105 rats	----	----	15 - 100 mg. per kg. in the diet	P.O.	0[414]	Several died during exp.	10 wks. or 3 mos.
	7 dogs	----	M	50 mg. per kg. daily, 6 d. per wk. in food	P.O.	0	1 died at 5 wks.	6 wks.
786. --DECAPRYN SUCCINATE 								
Thompson and Werner, 1948	24 rats	----	M&F	5 - 45 mg. per kg. twice daily, 6 d. per wk.	P.O.	0	----	38 d.
	Rats	----	M&F	50 - 400 mg. per kg. (increasing doses)	P.O.	0	Several died	Over 6 wks.
	8 dogs	Mongrel	M&F	3 - 15 mg. per kg. in capsules	P.O.	0	100%	8 wks.
	2 monkeys	Macaca mulatta	M&F	2 - 20 mg. per kg. (increasing doses)	P.O.[415]	0	100%	13 wks.
787. --DEHYDROACETIC ACID 								
Spencer et al., 1950b	75 rats	Wistar	M&F	0.02 - 0.10% in the diet	P.O.	0	41 alive at 2 yrs.	2 yrs.
	20 rats	----	M	0.01 - 0.1 gm. per kg. in olive oil	P.O.[415]	0	----	34 d.
	3 monkeys	Rhesus	----	0.05 - 0.20 gm. per kg. in olive oil (5%) repeated doses	P.O.[415]	0	----	1 yr.

[413] 8-(2'-Methoxy-3'-hydroxymercuripropyl)-coumarin-3-carboxylic acid-theophyllin.
[414] One large encapsulated cyst of the liver.
[415] Stomach tube.

Reference	Animal	Strain or type	Sex	Preparation and dose	Site and route	Animals with tumors	Survival	Duration of experiment
788. --2,6-DIAMINOANTHRAPYRIMIDINE 								
Hurst, 1952	Mice	----	----	4 mg. per 20 gm. body wt., twice only on 1 d.	P.O.[415]	0[416]	Killed at intervals	168 d.
	10 mice	----	----	4 mg. per 20 gm. body wt., 2 doses a week	P.O.	0	Died between 13 - 56 d.	56 d.
	50 mice	----	----	4 mg. per 20 gm. body wt., one dose every 2 wks.	P.O.	0[417]	7 alive at 1 yr.	472 d.
789. --2,4-DIAMINO-5-p-CHLOROPHENYL-6-ETHYLPYRIMIDINE 								
Schmidt et al., 1953b	72 rats	----	----	0.00625 - 0.2% in the diet	P.O.	0	10 deaths	6 wks.
	20 monkeys	Rhesus	----	1.25 - 40 mg. per kg. daily for 42 d. (5 mg. per kg. per k. and over was lethal)	P.O.	0	----	6 wks.
790. --1,2,5,6-DIBENZCARBAZOLE 								
Peacock and Peacock, 1949	7 fowls	BL	F	15 mg. pellets[418]	Preening gland	0	----	18 mos.
791. --3,4,5,6-DIBENZCARBAZOLE 								
Kirby, 1948a	12 mice	cba	M&F	0.2% in acetone 3 times weekly	Skin	Tumors[419]	----	----
	10 mice	cba	M&F	0.3 mg. in 0.25 ml. tricaprylin and 0.5 mg. in 0.25 ml. arachis oil, 1 inj. of each	S.C.	8 sarc.[420]	8 alive at 110 d.	At least 110 d.

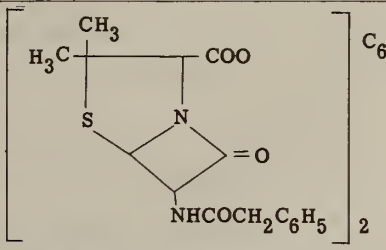
[415] Stomach tube.
[416] Blue pigmentation of liver.
[417] Multiple hepatomas in 7 mice surviving 1 year. Thought by author to be spontaneous.
[418] Additionally painted with croton oil, 1% in acetone.
[419] Papilloma, epithelioma and 1 hepatoma.
[420] Also 20% with hepatomas.

Reference	Animal	Strain or type	Sex	Preparation and dose	Site and route	Animals with tumors	Survival	Duration of experiment

791.--3,4,5,6-DIBENZCARBAZOLE--Continued

Armstrong and Bonser, 1950	102 mice	CBA	M&F	In arachis oil twice weekly, various concentrations (0.125-1.0%), total dose 7 - 23.0 mg., in mice surviving more than 17 wks.	P.O.[415]	Tumors[421]	----	49 wks.
	30 mice	Strong A	M&F	0.125 - 0.25% soln. in arachis oil, 0.1 cc. twice weekly, total dose (avg.) 17.8 mg. in mice surviving 36 wks.	P.O.[415]	Tumors[422]	24 alive at 36 wks.	59 wks.
Bonser et al., 1952	Mice	White	----	10 - 15% in 10 - 20 mg. pellets in paraffin wax	Urinary bladder	Tumors[423]	8 alive at 14 wks.	Over 30 wks.
Lacassagne et al., 1955	15 mice	XVII	----	1 mg. in peanut oil, 3 inj. at monthly intervals	S.C.	7 sarc.	7 alive at 240 d.	380 d.

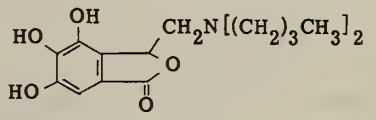
792.--N,N'-DIBENZYLETHYLENEDIAMINE PENICILLIN



$C_6H_5CH_2NH_2\text{-}CH_2CH_2\text{-}NH_2\text{-}CH_2C_6H_5 \cdot 4H_2O$

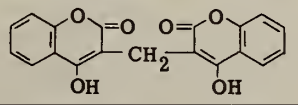
Forbes et al., 1953	Rats	Carworth or Sprague-Dawley	M	25 or 5 mg. per d. in the diet (diet inducing liver necrosis)	P.O.	0	----	200 d.

793.--3'-DI-n-BUTYLAMINOMETHYL-4,5,6-TRIHYDROXYBENZO [1,2-c] FURAN-1'(3')-ONE[424]



Hazleton, 1949	6 cats	----	----	60 or 120 mg. per kg. daily	P.O.	0	----	183 d.
	12 guinea pigs	----	----	15 - 200 mg. per kg. daily	P.O.	0	----	204 d.
	9 rats	----	----	15 - 200 mg. per kg. daily	P.O.	0	----	254 d.
	14 mice	----	----	100 or 200 mg. per kg. daily	P.O.	0	----	335 d.

794.--DICUMAROL



Hueck, 1951	1 rabbit	----	M	In powder form, total of 198 mg. over 40 d.	P.O.	0	Killed at 40 d.	40 d.
	6 rats	----	M	In powder form mixed with moist bread, 3 received total of 29 mg., 1 received total of 40 mg. and 2 received total of 79 mg.	P.O.	0	Killed at 3 mos.	3 mos.

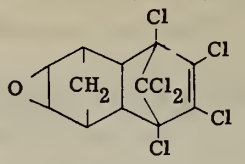
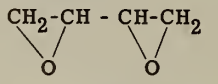
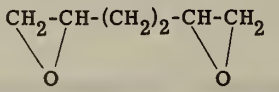
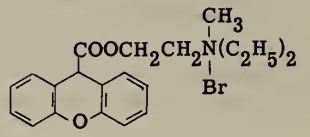
[415] Stomach tube.

[421] 18 with gastric papillomas, 4 with gastric carcinomas, 15 with benign hepatomas, 1 with malignant hepatoma.

[422] 17 with gastric papillomas, 3 with gastric carcinomas, 4 with benign hepatoma, 18 with malignant hepatoma.

[423] 2 with carcinoma of bladder, 2 with papilloma of bladder.

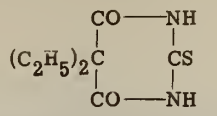
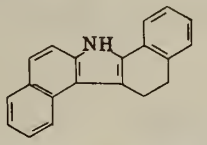
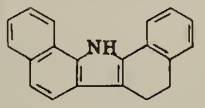
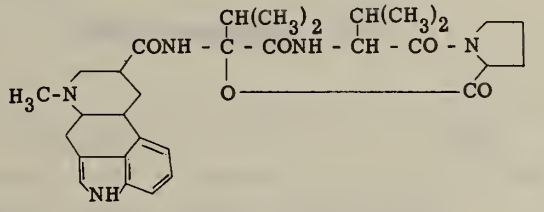
[424] Anthallan.

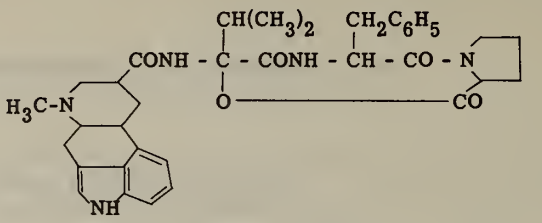
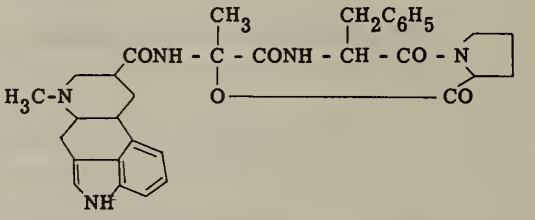
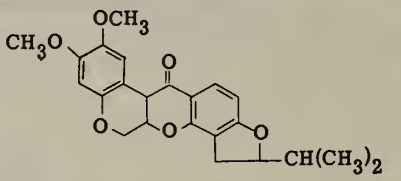
Reference	Animal	Strain or type	Sex	Preparation and dose	Site and route	Animals with tumors	Survival	Duration of experiment
795. --DIELDRIN[425] 								
Bundren et al., 1952	6 rabbits	----	----	10 - 110 mg. per wk. in capsules, 11 - 25 wks.	P.O.	0	----	25 wks.
	11 rats	----	----	0.125 - 0.250% emulsion in xylene and water	Dipped	0	2 died	10 wks.
	Rabbit	----	----	30 mg. per kg. body wt., emulsion in xylene and water	Dipped	0	Sacrificed	70 d.
796. --1,2,3,4-DIEPOXYBUTANE 								
Boyland and Sargent, 1951	12 mice	Stock	----	2.5 mg. per ml. in arachis oil, 0.05 ml. of soln. in 1,2, or 4 sites	Intradermal	0	----	At least 91 d.
Hendry et al., 1951b	20 mice	Stock	M	25% soln. in acetone twice weekly, 6 times and 12.5% twice (2 drops)	Skin	0	----	11 mos.
	20 mice	Stock	M	10% by vol. in arachis oil, 1 drop daily (5 days per wk.) for 3 mos., 66 doses	Skin	0	----	8 mos.
	14 rats	Albino stock	M&F	0.4% in arachis oil, either 1 or 2 mg. per body wt., 12 or 13 doses	I.P.	1[426]	----	18 mos.
797. --1,2,5,6-DIEPOXYHEXANE 								
Boyland and Sargent, 1951	12 mice	Stock	----	5.0 mg. per ml. in arachis oil, 0.05 ml. of soln. in 1, 2 or 4 sites	Skin	0	----	At least 50 d.
798. --β-DIETHYLAMINOETHYLXANTHENE-9-CARBOXYLATE METHOBROMIDE 								
Freese et al., 1952	Rats	Sprague-Dawley	M&F	27 - 115 mg. per kg. daily in capsule	P.O.	0	5 alive at 277 d.	278 d.
	Rats	Sprague-Dawley	M&F	415 and 280 mg. per kg. aqueous soln., 5 d. per wk.	P.O.[427]	0	----	443 d.
	Rats	Sprague-Dawley	M&F	104 and 208 mg. per kg. aqueous soln., 5 d. per wk.	P.O.[427]	0	----	645 d.

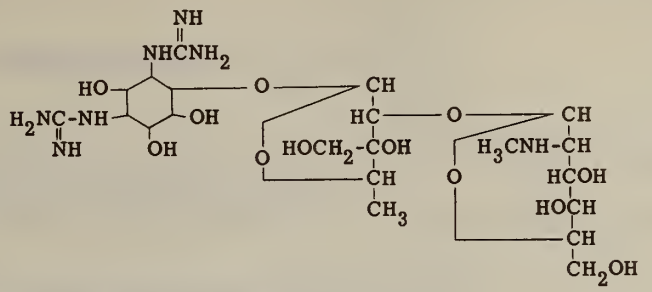
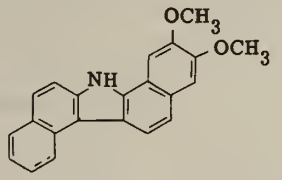
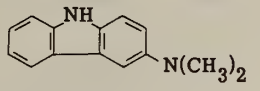
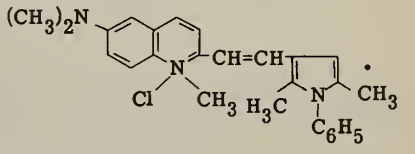
[425] 85% pure.

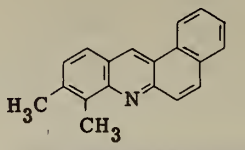
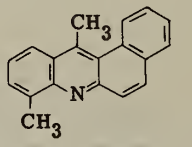
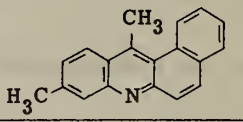
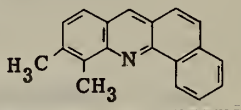
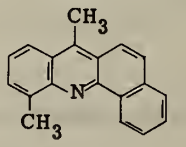
[426] Mesenteric mixed cell sarcoma. "Chondrosarcomatous mass" in ribs. Sarcoma in testis. All in 1 rat.

[427] Stomach tube.

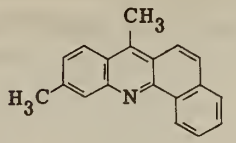
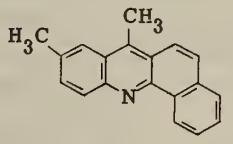
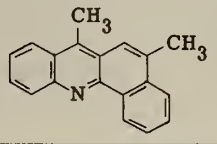
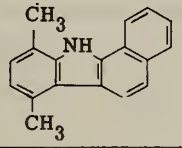
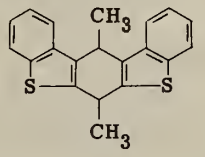
Reference	Animal	Strain or type	Sex	Preparation and dose	Site and route	Animals with tumors	Survival	Duration of experiment
799.--5,5-DIETHYL-2-THIOBARBITURIC ACID 								
Telo, 1949	3 rabbits	----	----	Total of 2 gm. for 2 rabbits, total of 16 gm. and 22 mm. for 1 rabbit	P.O.	0	2 alive at 54 d.	54 d.
Baglioni and Lorenzoni, 1952	5 rats	Albino	M&F	3 mg. per d.	P.O.	0	3 alive	246 d.
800.--3,4-DIHYDRO-1,2,5,6-DIBENZCARBAZOLE 								
Lacassagne et al., 1955	10 mice	XVII	----	1 mg. in peanut oil, 3 inj. at monthly intervals	S.C.	1 sarc.	4 alive at 400 d.	500 d.
801.--3,4-DIHYDRO-1,2,7,8-DIBENZCARBAZOLE 								
Lacassagne et al., 1955	15 mice	XVII	----	1 mg. in peanut oil, 3 inj. at monthly intervals	S.C.	0	4 alive at 240 d.	350 d.
802.--DIHYDROERGOCORNINE 								
Smith and Zalman, 1949	11 rats	----	----	0.8 - 3.4 mg. per kg., 6 times weekly for 17 wks.	S.C.	0	9 alive	17 wks.

Reference	Animal	Strain or type	Sex	Preparation and dose	Site and route	Animals with tumors	Survival	Duration of experiment
803.--DIHYDROERGOCRISTINE 								
Smith and Zalman, 1949	16 rats	----	----	0.3 - 2.3 mg. per kg., 6 times weekly for 15 wks.	S.C.	0	16 alive	15 wks.
804.--DIHYDROERGOTAMINE 								
Smith and Zalman, 1949	11 rats	----	----	1.3 - 5.0 mg. per kg. 6 times weekly for 15 wks.	S.C.	0	9 alive	15 wks.
805.--DIHYDROROTENONE 								
Ambrose et al., 1953a	30 rats	Albino	F	0.001 - 0.032% in the diet	P.O.	0	27 alive	400 d.

Reference	Animal	Strain or type	Sex	Preparation and dose	Site and route	Animals with tumors	Survival	Duration of experiment
806. --DIHYDROSTREPTOMYCIN 								
Vanderhaeghe, 1950	Rabbits	----	----	500 mg. per kg., 3 inj. per d. for 30 or 35 d.	S.C.	0	1 died at 36 d.	At least 40 d.
807. --2',3'-DIMETHOXY-1,2,5,6-DIBENZCARBAZOLE 								
Lacassagne et al., 1955	15 mice	XVII	----	1 mg. in peanut oil, 3 inj. at monthly intervals	S.C.	0	7 alive at 335 d.	580 d.
808. --3-DIMETHYLAMINOCARBAZOLE 								
Miller and Miller, 1948	10 rats	Sprague-Dawley	M	0.056% in the diet for 4 mos.	P.O.	0	----	9 mos.
809. --6-DIMETHYLAMINO-[2-(2,5-DIMETHYL-1-PHENYL-3-PYRRYL)-VINYL]-1-METHYLQUINOLINIUM CHLORIDE 								
Weston et al., 1953	9 dogs	----	M	5 - 80 mg. per kg. twice daily, 5 d. per wk. for 5 to 7 wks. (in gelatin capsules)	P.O.	0	----	7 wks.

Reference	Animal	Strain or type	Sex	Preparation and dose	Site and route	Animals with tumors	Survival	Duration of experiment
810.--1,2-DIMETHYL-5,6-BENZACRIDINE 								
Zajdela and Buu-Hoï, 1950a	10 mice	----	----	0.5 mg. in peanut oil, single dose plus 1 drop of an 0.3% acetone soln., twice weekly until tumor appeared or for at at least 6 mos.	S.C., Skin	0	----	At least 6 mos.
811.--1,10-DIMETHYL-5,6-BENZACRIDINE 								
Lacassagne et al., 1947	10 mice	XVII	M&F	0.25 ml. of a 1% soln. in olive oil, twice at 10 d. interval	S.C.	Tumors[428]	----	454 d.
812.--2,10-DIMETHYL-5,6-BENZACRIDINE[429] 								
Lacassagne et al., 1947	10 mice	XVII	M&F	0.25 ml. of a 1% soln. in olive oil, twice at 10 d. interval	S.C.	0	alive at 100 d.	128 d.
813.--1,2-DIMETHYL-7,8-BENZACRIDINE 								
Zajdela and Buu-Hoï, 1950a	10 mice	----	----	0.5 mg. in peanut oil, single dose plus 1 drop of an 0.3% acetone soln. twice weekly until tumor appeared or for at least 6 mos.	S.C., Skin	0	----	At least 6 mos.
814.--1,10-DIMETHYL-7,8-BENZACRIDINE[430] 								
Lacassagne et al., 1947	10 mice	XVII	M&F	0.25 ml. of a 1% soln. in olive oil, twice at 10 d. intervals	S.C.	Tumors[431]	----	522 d.

[428] 1 sarcoma and 2 lung adenomas.
[429] Called 6,9-Dimethyl-1,2-benzacridine in 2nd Edition.
[430] Called 5,9-Dimethyl-3,4-benzacridine in 2nd Edition.
[431] 4 with sarcomas, 1 with epidermoid epithelioma of the stomach and 3 with lung tumors (at least 1 adenocarcinoma).

Reference	Animal	Strain or type	Sex	Preparation and dose	Site and route	Animals with tumors	Survival	Duration of experiment
815. --2,10-DIMETHYL-7,8-BENZACRIDINE[432] 								
Lacassagne et al., 1947	10 mice	XVII	M&F	0.25 ml. of a 1% soln. in olive oil, twice at 10 d. interval	S.C.	6 sarc.	----	193 d.
816. --3,10-DIMETHYL-7,8-BENZACRIDINE[433] 								
Lacassagne et al., 1947	10 mice	XVII	M&F	0.25 ml. of a 1% soln. in olive oil, twice at 10 d. interval	S.C.	5 sarc.	----	227 d.
817. --6,10-DIMETHYL-7,8-BENZACRIDINE 								
Zajdela and Buu-Hoi, 1950a	10 mice	----	----	0.5 mg. in peanut oil, single dose plus 1 drop of an 0.3% acetone soln., twice weekly until tumor appeared or for at least 6 mos.	S.C., Skin	0	----	At least 6 mos.
818. --5,8-DIMETHYL-1,2-BENZCARBAZOLE 								
Lacassagne et al., 1955	15 mice	XVII	----	1 mg. in peanut oil, 3 inj. at monthly intervals	S.C.	0	5 alive at 300 d.	430 d.
819. --6,12-DIMETHYLBENZO [1:2b,5:4b'] DITHIONAPHTHENE[434] 								
Ranadive (Unpub. data)	13 mice	Swiss	F	.002 mg. in 0.2 ml. of tricaprylin per animal, one injection	S.C.	12[435]	1 alive at 11 mos.	9 mos.

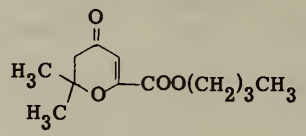
[432] Called 6,9-Dimethyl-3,4-benzacridine in 2nd Edition.
[433] Called 7,9-Dimethyl-3,4-benzacridine in 2nd Edition.
[434] Compounds synthesized by Ghaisas, Rabindran and Tilak, Proc. Indian Acad. Sci., 37 A, 114, 1953.
[435] Fibrosarcomas, latent period 3 to 4 months.

Reference	Animal	Strain or type	Sex	Preparation and dose	Site and route	Animals with tumors	Survival	Duration of experiment

819.--6, 12-DIMETHYLBENZO [1:2b, 5:4b'] DITHIONAPHTHENE--Continued

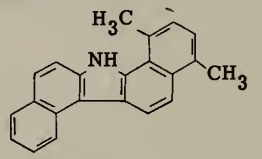
Ranadive (Unpub. data)	12 mice	Swiss	F	0.5% in benzene twice a wk.	Skin	0	7 alive at 11 mos.	At least 11 mos.

820.--α,α DIMETHYL-α'-CARBOBUTOXYDIHYDRO-γ-PYRONE[436]



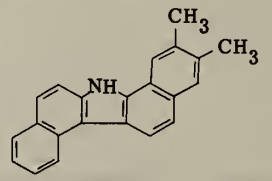
Draize et al., 1948	70 rats	----	----	Undiluted, daily	Skin	0	----	90 d.
	110 guinea pigs	----	----	Undiluted, daily	Skin	0	----	90 d.
	100 mice	----	----	Undiluted, daily	Skin	0	----	90 d.
	80 rabbits	----	----	Undiluted, daily	Skin	0	----	90 d.
	80 chicks	----	----	Undiluted, daily	Skin	0	----	90 d.

821.--1',4'-DIMETHYL-1,2,5,6-DIBENZCARBAZOLE[436a]



Lacassagne et al., 1955	10 mice	XVII	----	1 mg. in peanut oil, 3 inj. at monthly intervals	S.C.	0	4 alive at 430 d.	550 d.

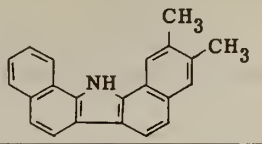
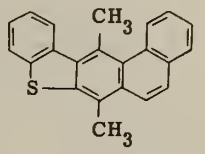
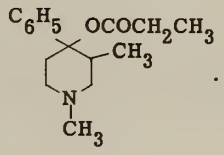
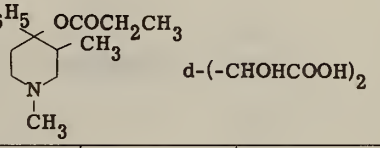
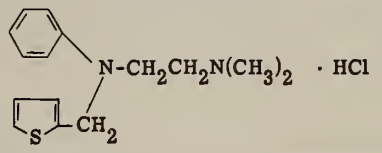
822.--2',3'-DIMETHYL-1,2,5,6-DIBENZCARBAZOLE



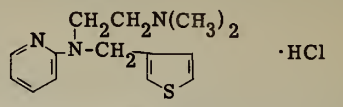
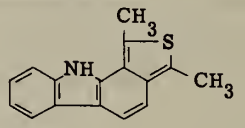
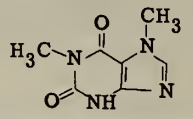
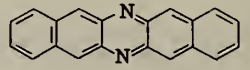
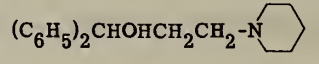
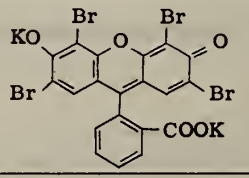
Lacassagne et al., 1955	10 mice	XVII	----	1 mg. in peanut oil, 3 inj. at monthly intervals	S.C.	0	3 alive at 230 d.	430 d.

[436]Indalone.

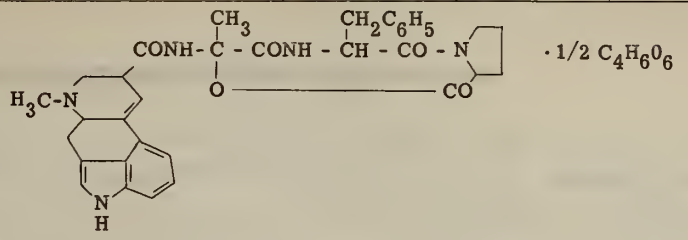
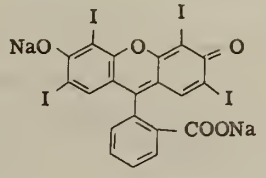
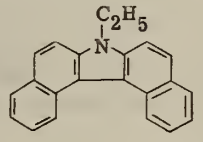
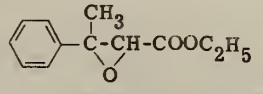
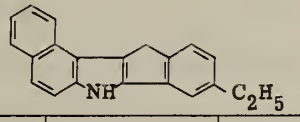
[436a] Erroneously named 1,4'-dimethyl-1,2,5,6-dibenzcarbazole in the original paper.

Reference	Animal	Strain or type	Sex	Preparation and dose	Site and route	Animals with tumors	Survival	Duration of experiment
823. --2',3'-DIMETHYL-1,2,7,8-DIBENZCARBAZOLE 								
Lacassagne et al., 1955	10 mice	XVII	----	1 mg. in peanut oil, 3 inj. at monthly intervals	S.C.	0	6 alive at 245 d.	330 d.
824. --4,9-DIMETHYL-2,3,5,6-DIBENZOTHIOPHANTHRENE[437] 								
Ranadive (unpub. data)	3 mice	Swiss	F	.002 mg. in 0.2 ml. of tricaprylin per animal, one inj.	S.C.	2[438]	----	4 mos.
	14 mice	Swiss	F	0.5% in benzene twice a wk.	Skin	Tumors[439]	----	8 mos.
825. --dl-α-1,3-DIMETHYL-4-PHENYL-4-PROPIONOXYPIPERIDINE HYDROCHLORIDE 								
Randall and Lehmann, 1948	10 rats	----	----	6 mg. per kg. daily for 7 wks.	S.C.	0	----	14 wks.
826. --l-β-1,3-DIMETHYL-4-PHENYL-4-PROPIONOXYPIPERIDINE D-ACID TARTRATE 								
Randall and Lehmann, 1948	10 rats	----	----	1 mg. per kg. daily for 7 wks.	S.C.	0	----	14 wks.
827. --N,N-DIMETHYL-N'-(2-THENYL)-N'-PHENYLETHYLENEDIAMINE HYDROCHLORIDE 								
Ercoli et al., 1948	10 rats	----	M&F	20 mg. per kg., 5 times a wk. for 3 mos.	P.O.[440]	0	----	3 mos.
	6 rabbits	----	----	6 - 8 mg. per kg. 5 d. per wk. for 6 wks.	I.V.	0	6 alive at 6 wks.	6 wks.

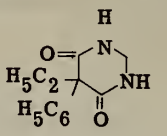
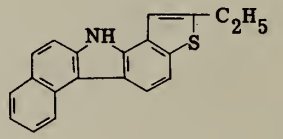
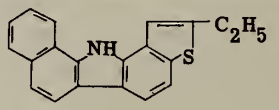
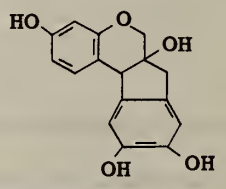
[437] Compound synthesized by Tilak, Proc. Indian Acad. Soc. 33 A, 131, 1951.
[438] Fibrosarcomas.
[439] 13 with epidermoid carcinomas, latent period 4 to 5 mos.
[440] Stomach tube.

Reference	Animal	Strain or type	Sex	Preparation and dose	Site and route	Animals with tumors	Survival	Duration of experiment
828.--N,N-DIMETHYL-N'-(3-THENYL)-N'-(2-PYRIDYL)-ETHYLENEDIAMINE HYDROCHLORIDE  ·HCl								
Hoppe and Lands, 1949	6 dogs	Mongrel	M&F	5 and 10 mg. per kg. in capsules daily	P.O.	0	6 alive at 90 d.	90 d.
829.--2',5'-DIMETHYL-3',4',1,2-THIOPHENOCARBAZOLE 								
Lacassagne et al., 1955	10 mice	XVII	----	1 mg. in peanut oil, 3 inj. at monthly intervals	S.C.	0	4 alive at 220 d.	475 d.
830.--1,7-DIMETHYLXANTHINE 								
Kjerulf-Jensen, 1948	60 rats	----	----	0.25 - 25 μg. per 10 gm. per diet	P.O.	0	----	30 d.
831.--DINAPHTHAZINE 								
Hackmann, 1951b	20 mice	S.W.	----	Oil soln., 5 mg.	S.C.	3[441]	----	Over 41 wks.
832.--1,1-DIPHENYL-3-(N-PIPERIDYL)-1-PROPANOL HYDROCHLORIDE  ·HCl								
Cunningham et al., 1949	10 mice	----	M	40 mg. per kg. daily	I.P.	0	----	16 wks.
	20 rats	----	M	40 mg. per kg. daily	I.P.	0	----	16 wks.
	4 dogs	----	M&F	20 mg. per kg. daily	P.O.	0	----	15 wks.
	8 guinea pigs	----	M	40 mg. per kg. daily	I.P.	0	----	16 wks.
833.--EOSIN 								
Willheim and Ivy, 1953	10 rats	Wistar	M&F	4% of the diet	P.O.	0	----	2 yrs.

[441] Spindle cell sarcoma, cystic tumor of neck, breast sarcoma.

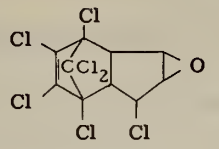
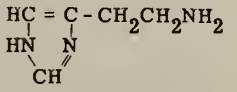
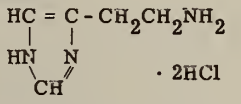
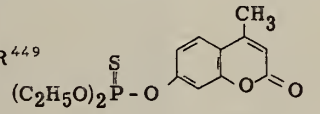
Reference	Animal	Strain or type	Sex	Preparation and dose	Site and route	Animals with tumors	Survival	Duration of experiment
				834.--ERGOTAMINE TARTRATE 				
Smith and Zalman, 1949	10 rats	----	----	0.6, 1.4 mg. per kg., 6 times weekly for 15 wks.	S.C.	0[441a]	10 alive	15 wks.
				835.--ERYTHROSINE[442] 				
Willheim and Ivy, 1953	10 rats	Wistar	M&F	4% of the diet	P.O.	0[443]	----	2 yrs.
				836.--N-ETHYL-3,4,5,6-DIBENZCARBAZOLE 				
Kirby, 1948a	9 mice	cba	M&F	0.2% in acetone 3 times weekly	Skin	8 pap. and epi.	----	200 d.
	12 mice	cba	M&F	0.3 mg. in 0.25 ml. tricaprylin and 0.5 mg. in 0.25 ml. arachis oil, one inj. of each	S.C.	1[444]	3 alive at 400 d.	400 d.
				837.--ETHYL EPOXYMETHYLPHENYLACRYLATE 				
Draize et al., 1948	40 mice	----	----	Undiluted, daily	Skin	0	----	90 d.
	50 rats	----	----	Undiluted, daily	Skin	0	----	90 d.
				838.--6'-ETHYL-2,3,1',2'-INDENO-4,5-BENZOINDOLE 				
Lacassagne et al., 1955	30 mice	XVII	----	1 mg. in peanut oil, 3 inj. at monthly intervals	S.C.	0	11 alive at 250 d.	525 d.

[441a] No pathology reported.
[442] FD & C Red 3.
[443] 1 hepatic cirrhosis.
[444] Angiosarcoma, also 1 hepatoma.

Reference	Animal	Strain or type	Sex	Preparation and dose	Site and route	Animals with tumors	Survival	Duration of experiment
839.--5-ETHYL-5-PHENYLHEXAHYDROPYRIMIDINE-4,6-DIONE 								
Bogue and Carrington, 1953	3 monkeys	----	----	50 - 250 mg. per kg. once daily, 40 doses	P.O.[445]	0	100% alive	8 wks.
840.--5'-ETHYL-2',3',1,2-THIOPHENO-5,6-BENZCARBAZOLE 								
Lacassagne et al., 1955	10 mice	XVII	----	1 mg. in peanut oil, 3 inj. at monthly intervals	S.C.	0	5 alive at 105 d.	147 d.
	10 mice	CD	----	1 mg. in peanut oil, 3 injections at monthly intervals	S.C.	0	7 alive at 200 d.	350 d.
841.--5'-ETHYL-2',3',1,2-THIOPHENO-7,8-BENZCARBAZOLE 								
Lacassagne et al., 1955	10 mice	XVII	----	1 mg. in peanut oil, 3 inj. at monthly intervals	S.C.	0	6 alive at 500 d.	550 d.
842.--GALACTOSE $C_6H_{12}O_6$								
Craig and Maddock, 1953	Rats	Wistar	----	70% in the diet	P.O.	0	6 alive at 78 d.	78 d.
843.--GLUCOSE $C_6H_{12}O_6$								
Nelson and Lusky, 1951	5 rabbits	----	M&F	10% in normal saline, 10 cc. per kg., 16 inj.	I.V.	0	1 died	2 mos.
844.--HEMATOXYLIN 								
Willheim and Ivy, 1953	10 rats	Wistar	M&F	4% of the diet	P.O.	Tumors[446]	----	2 yrs.

[445] Stomach tube.

[446] 2 lymphosarcomas (50 controls had no tumors).

Reference	Animal	Strain or type	Sex	Preparation and dose	Site and route	Animals with tumors	Survival	Duration of experiment
845.--HEPTACHLOR EPOXIDE[446a] 								
Radomski and Davidow, 1953	66 rats	----	M&F	30 p.p.m. in the diet	P.O.	0	Sacrificed at 12 wks.	12 wks.
846.--HISTAMINE 								
de Vinals, 1950	51 mice	----	----	Repeated injections with "high doses"	S.C.	Tumors[450]	----	362 d.
Pfaltz and Lacour, 1952	25 rats	----	----	0.1 mg. for 56 d., 0.3 mg. for 56 d., 0.5 mg. until death, twice weekly	S.C.	1 pap.[451]	----	----
847.--HISTAMINE DIHYDROCHLORIDE[447] 								
de Vinals, 1949	10 mice	----	----	0.1 mg. every other d. for 10 wks., then 0.3 mg. every other d. for 6 wks., then 0.5 mg. every other d. for 10 wks.	S.C.	1 pap.	8 alive at 26 wks.	1 yr.
	10 mice	----	----	0.1 mg. every other d. for 2.5 mos., 0.3 mg. every other d. for 1.5 mos., 0.5 mg. every other d. for 2.5 mos.	S.C.	0[448]	----	1 yr.
848.--7-HYDROXY-4-METHYLCOUMARIN DIETHOXYTHIOPHOSPHORIC ACID ESTER[449] 								
Frawley et al., 1952	5 rats	----	M	1 p.p.m. in the diet	P.O.	0[441a]	----	8 wks.

[441a] No pathology reported.

[446a] 1 or 3a,4,5,6,7,8,8-Heptachloro-3a,4,7,7a-tetrahydro-4, 7 methanoindene epoxide.

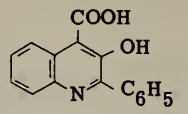
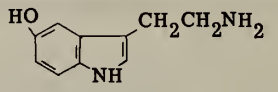
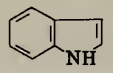
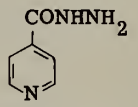
[447] Called Histamine hydrochloride.

[448] Hyperplasia of Malpighian epithelium and of cylindrical epithelium in all animals, 1 papillomatous mass.

[449] E 838.

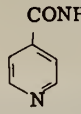
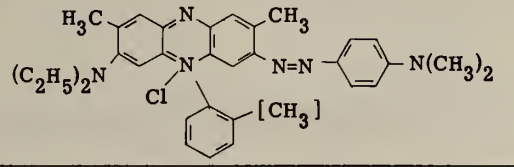
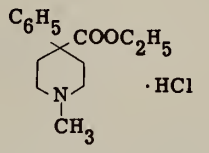
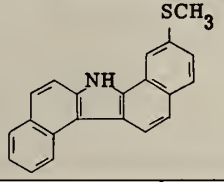
[450] 15 with squamous cell papillomas of forestomach, 1 with adenomatous polyp; papilloma said to resemble carcinoma in situ. (14 controls did not have these lesions).

[451] Of cardiac stomach.

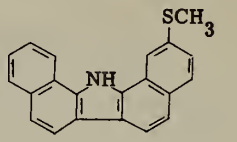
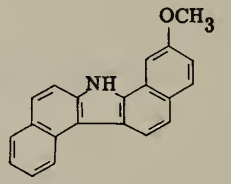
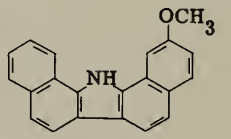
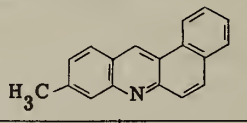
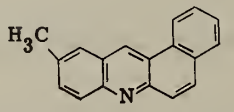
Reference	Animal	Strain or type	Sex	Preparation and dose	Site and route	Animals with tumors	Survival	Duration of experiment
849.--3-HYDROXY-2-PHENYLCINCHONINIC ACID 								
Marshall and Dearborn, 1950	3 dogs	----	----	50 mg. per kg. in capsules daily for 30 d.	P.O.	0	100%	30 d.
	2 monkeys	Rhesus	----	50 mg. per kg. in aqueous suspension daily for 30 d.	P.O.	0	100%	30 d.
Iversen et al., 1953	5 guinea pigs	----	----	100 mg. per kg. per d., 30 doses	P.O.[445]	0	2 died	Over 30 d.
	5 rabbits	----	----	100 mg. per kg. per d., 30 doses	P.O.[445]	0	100%	30 d.
850.--5-HYDROXYTRYPTAMINE 								
Correale, 1953	20 rats	----	----	0.4 - 0.8 mg. per kg. body wt. twice daily for 2 mos.	S.C.	0[441a]	----	60 d.
851.--INDOLE 								
Kaiser, 1953	25 rats	White	----	10 - 20 mg. daily (total dose 10 g.)	P.O.	0	22 alive at 1 yr.	32 mos.
	25 rats	W	M	100 - 200 mg. per kg. in the diet (avg. of 10 g. per rat)	P.O.	0	----	825 d.
852.--ISONICOTINIC ACID HYDRAZIDE 								
Benson et al., 1952	3 dogs	----	----	1 - 20 mg. per kg., 5 d. per wk. for 13 wks.	I.V.	0	----	13 wks.
	40 rats	Wistar	M	0.001 - 0.05% of the diet	P.O.	0	----	12 wks.
Rubin et al., 1952	6 dogs	Mongrel	----	4 - 17.5 mg. per kg. per d., 6 d. per wk.	P.O.	0	4 alive at 20 wks.	20 wks.
Angelico, 1953	36 rats	Albino	M&F	10 - 640 mg. per 100 g. of food	P.O.	0	----	22 mos.
Miyamoto et al., 1953	3 monkeys	----	----	10 - 40 mg. per kg. body wt., daily	P.O.	0	----	----
Rubin and Burke, 1953	22 dogs	Mongrel	M&F	2 - 17.5 mg. per kg. per d. for 2 to 8 mos.	P.O.	0[441a]	----	8 mos.
Schmidt et al., 1953a	2 monkeys	Rhesus	----	2.5 or 10 mg. per kg. per d. for 14 d. then 40 mg. per kg. per d. for 38 d.	P.O.[445]	0	100%	52 d.
	169 monkeys	Rhesus	----	5 mg. per kg. per d. for 71 d. then 20 mg. per kg. per d. for 161 d.	P.O.[445]	0[441a]	44 sacrificed at 161 d.	Over 288 d.
	2 monkeys	Rhesus	----	10 mg. per kg. per d. for 52 d. then 80 mg. per kg. per d. for 20 d.	P.O.[445]	----	100%	72 d.

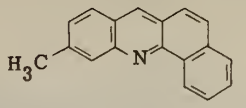
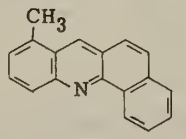
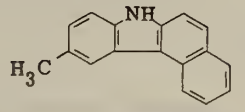
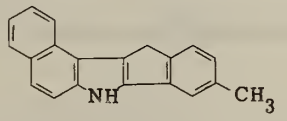
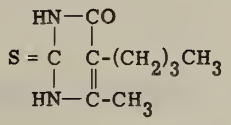
[441a] No pathology reported.

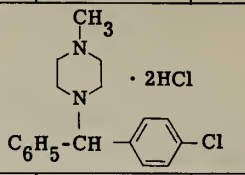
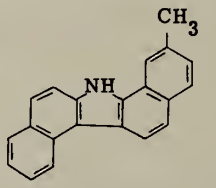
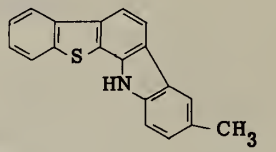
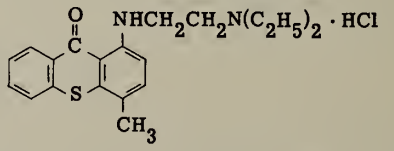
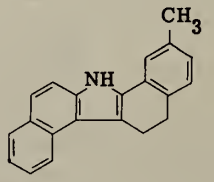
[445] Stomach tube.

Reference	Animal	Strain or type	Sex	Preparation and dose	Site and route	Animals with tumors	Survival	Duration of experiment
853. --1-ISONICOTINYL-2-ISOPROPYL HYDRAZINE[452] 								
Bensen et al., 1952	60 rats	Wistar	M	0.005 - 0.08% of the diet	P.O.	0	----	13 wks.
	6 dogs	----	----	3.5 - 14.0 mg. per kg.	I.V.	0	100%	13 wks.
	6 dogs	----	----	3.5 - 14.0 mg. per kg.	I.M.	0	100%	13 wks.
	6 dogs	----	----	3.5 - 14.0 mg. per kg.	P.O.	0	100%	13 wks.
854. --JANUS GREEN 								
Haley and Stolarsky, 1951	3 rabbits	Dutch	F	0.48 mg. per kg. in saline, twice weekly	I.V.	0	----	90 d.
855. --LACTOSE $C_{12}H_{22}O_{11}$								
Cardeza, 1950	Rats[453]	----	----	Daily inj. for 6 mos.	----	0	----	6 mos.
Rodriquez and Martinez, 1950	Rats[453]	----	F	25 mg. dissolved in 0.5 ml. of 0.9% sodium chloride soln. for 3 mos.	S.C.	0	----	12 mos.
856. --MEPERIDINE HYDROCHLORIDE[454] 								
Barlow and Lewis, 1951	Rats	----	----	2 - 20 mg. per kg. per d.	P.O.[445]	0	----	60 d.
	Rabbits	----	----	50 mg. per kg. per d.	P.O.	0	----	30 d.
857. --2'-MERCAPTOMETHYL-1,2,5,6-DIBENZCARBAZOLE 								
Lacassagne et al., 1955	10 mice	CD	----	1 mg. in peanut oil, 3 inj. at monthly intervals	S.C.	0	6 alive at 335 d.	520 d.

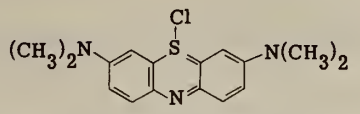
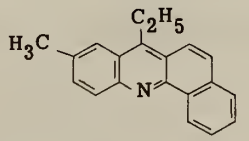
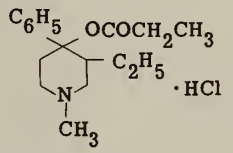
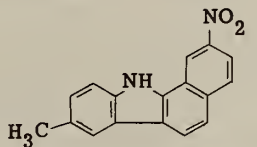
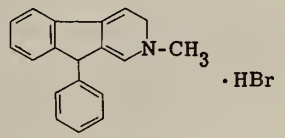
[445] Stomach tube.
[452] Marsilid.
[453] Castrated and 95% of the pancreas removed.
[454] Demerol hydrochloride; ethyl 1-methyl-4-phenylpiperidine-4-carboxylate hydrochloride.

Reference	Animal	Strain or type	Sex	Preparation and dose	Site and route	Animals with tumors	Survival	Duration of experiment
858. --2'-MERCAPTOMETHYL-1,2,7,8-DIBENZCARBAZOLE 								
Lacassagne et al., 1955	10 mice	XVII	----	1 mg. in peanut oil, 3 inj. at monthly intervals	S.C.	0	4 alive at 325 d.	490 d.
859. --2'-METHOXY-1,2,5,6-DIBENZCARBAZOLE 								
Lacassagne et al., 1955	15 mice	XVII	----	1 mg. in peanut oil, 3 inj. at monthly intervals	S.C.	0	5 alive at 240 d.	390 d.
860. --2'-METHOXY-1,2,7,8-DIBENZCARBAZOLE 								
Lacassagne et al., 1955	10 mice	XVII	----	1 mg. in peanut oil, 3 inj. at monthly intervals	S.C.	0	6 alive at 220 d.	435 d.
861. --2-METHYL-5,6-BENZACRIDINE 								
Zajdela and Buu-Hoi, 1950a	10 mice	----	----	0.5 mg. in peanut oil, single dose	S.C.	0	----	----
862. --3-METHYL-5,6-BENZACRIDINE 								
Rudali et al., 1952	18 rats	Wistar	----	8 - 10 mg. in the diet daily for 166 or 200 d.	P.O.	0	----	365 d. or 402 d.
	10 rats	Wistar	----	4 - 6 mg. in food daily for 195 d., deficient B complex diet	P.O.	0	----	1 yr.
	10 mice	XVII Ivory	----	In the diet for 195 d., deficient B complex diet	P.O.	0	----	335 d.

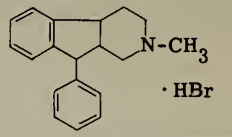
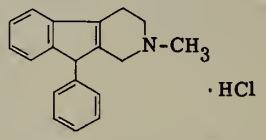
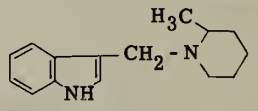
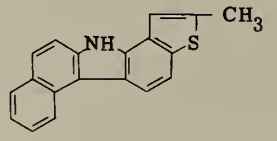
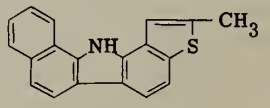
Reference	Animal	Strain or type	Sex	Preparation and dose	Site and route	Animals with tumors	Survival	Duration of experiment
863. --2-METHYL-7,8-BENZACRIDINE 								
Zajdela and Buu-Hoi, 1950a	10 mice	----	----	0.5 mg. in peanut oil, single dose plus 1 drop of an 0.3% acetone soln., twice weekly until tumor appeared or for at least 6 mos.	S.C., Skin	0	----	At least 6 mos.
864. --4-METHYL-7,8-BENZACRIDINE 								
Zajdela and Buu-Hoi, 1950a	10 mice	----	----	0.5 mg. in peanut oil, single dose	S.C.	0	----	----
865. --6-METHYL-3,4-BENZCARBAZOLE 								
Lacassagne et al., 1955	10 mice	XVII	----	1 mg. in peanut oil, 3 inj. at monthly intervals	S.C.	1 sarc.	4 alive at 213 d.	400 d.
	10 mice	XVII	----	1 mg. in peanut oil, 3 inj. at monthly intervals	S.C.	0	4 alive at 220 d.	300 d.
866. --6'-METHYL-4,5-BENZO-2,3,1',2'-INDENOINDOLE 								
Lacassagne et al., 1955	10 mice	XVII	----	1 mg. in peanut oil, 3 inj. at monthly intervals	S.C.	0	4 alive at 205 d.	290 d.
867. --4-METHYL-5-n-BUTYL-THIOURACIL 								
Miller and Jung, 1952	7 rats	----	----	0.5 g. per kg. for 109 d.	P.O.	0	----	109 d.

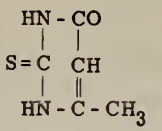
Reference	Animal	Strain or type	Sex	Preparation and dose	Site and route	Animals with tumors	Survival	Duration of experiment
868.--N-METHYL-N'-(4-CHLOROBENZHYDRYL)-PIPERAZINE DIHYDROCHLORIDE 								
Castillo et al., 1949	30 rats 9 dogs	Albino ----	M. ----	0.00625 - 0.1% in the diet 10 mg. per kg. daily	P.O. P.O.	0 0	---- ----	55 d. 2 mos.
869.--2'-METHYL-1,2,5,6-DIBENZCARBAZOLE 								
Lacassagne et al., 1955	15 mice	XVII	----	1 mg. in peanut oil, 3 inj. at monthly intervals	S.C.	0	4 alive at 295 d.	415 d.
870.--5-METHYL-1',2',2,3,-DIBENZTHIOPHENOINDOLE 								
Lacassagne et al., 1955	10 mice	XVII	----	1 mg. in peanut oil, 3 inj. at monthly intervals	S.C.	0	5 alive at 145 d.	280 d.
871.--1-METHYL-4-β-DIETHYLAMINOETHYLAMINOTHIOXANTHONE HYDROCHLORIDE[455] 								
Hawking and Ross, 1948	1 monkey	----	----	200 mg. per kg., 13 doses, 400 mg. per kg., 6 doses	P.O.	0	----	30 d.
872.--2'-METHYL-3,4-DIHYDRO-1,2,5,6-DIBENZCARBAZOLE 								
Lacassagne et al., 1955	10 mice	XVII	----	1 mg. in peanut oil, 3 inj. at monthly intervals	S.C.	0	5 alive at 275 d.	410 d.

[455] Miracil D.

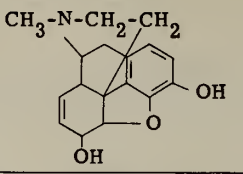
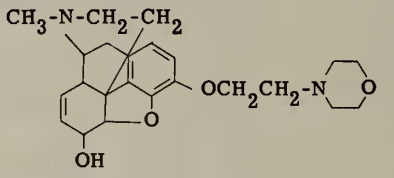
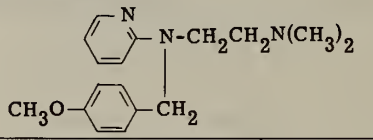
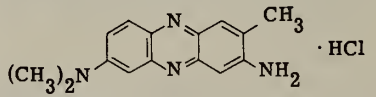
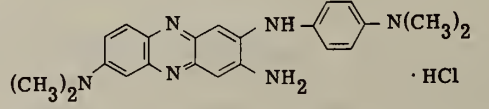
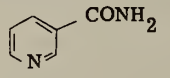
Reference	Animal	Strain or type	Sex	Preparation and dose	Site and route	Animals with tumors	Survival	Duration of experiment
873.--METHYLENE BLUE 								
Aaes-Jørgensen et al., 1951	8 rats	----	F	0.126% in the diet	P.O.	0	100% alive	10 wks.
Willheim and Ivy, 1953	10 rats	Wistar	M&F	4% of the diet	P.O.	0	----	2 yrs.
874.--3-METHYL-10-ETHYL-7,8-BENZACRIDINE 								
Lacassagne et al., 1947	10 mice	XVII	M&F	0.25 ml. of a 1% soln. in olive oil, twice at 10 d. interval	S.C.	1[456]	----	171 d.
875.--1-METHYL-3-ETHYL-4-PHENYL-4-PROPIONOXYPIPERIDINE HYDROCHLORIDE 								
Randall and Lehmann, 1948	10 rats	----	----	1 mg. per kg. daily for 7 wks.	S.C.	0	----	14 wks.
876.--6-METHYL-2'-NITRO-1,2-BENZCARBAZOLE 								
Lacassagne et al., 1955	15 mice	XVII	----	1 mg. in peanut oil, 3 inj. at monthly	S.C.	0	5 alive at 150 d.	390 d.
877.--2-METHYL-9-PHENYL-2,3-DIHYDRO-1-PYRIDINDENE HYDROBROMIDE 								
Lehmann, 1948	Rats	----	----	50 mg. per kg.	P.O.	0	----	8 mos.
	Dogs	----	----	30 mg. per kg.	P.O.	0	----	8 mos.

[456] Lung adenoma.

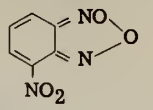
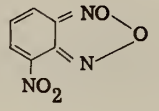
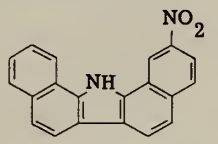
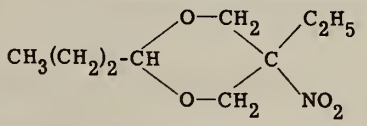
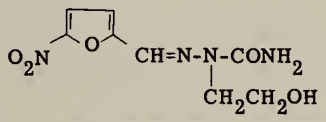
Reference	Animal	Strain or type	Sex	Preparation and dose	Site and route	Animals with tumors	Survival	Duration of experiment
878.--2-METHYL-9-PHENYL-2,3,4,4a,9,9a-HEXAHYDRO-1-PYRIDINDENE HYDROBROMIDE 								
Lehmann, 1948	Dogs	----	----	30 mg. per kg.	P.O.	0	----	8 mos.
	Rats	----	----	50 mg. per kg.	P.O.	0	----	8 mos.
879.--2-METHYL-9-PHENYL-2,3,4,9-TETRAHYDRO-1-PYRIDINDENE HYDROCHLORIDE 								
Lehmann, 1948	Rats	----	----	50 mg. per kg.	P.O.	0	----	8 mos.
	Dogs	----	----	30 mg. per kg.	P.O.	0	----	8 mos.
880.--3-(2'-METHYLPIPERIDYL-(N)-METHYL)-INDOLE 								
de Jongh and van Proosdij-Hartzema, 1952	25 rats	Wistar	----	1.25 mg. per kg. daily	I.P.	0	----	9 wks.
881.--5'-METHYL-3',2',1,2-THIOPHENO-5,6-BENZCARBAZOLE 								
Lacassagne et al., 1955	10 mice	XVII	----	1 mg. in peanut oil, 3 inj. at monthly intervals	S.C.	0	5 alive at 205 d.	365 d.
882.--5'-METHYL-3',2',1,2-THIOPHENO-7,8-BENZCARBAZOLE 								
Lacassagne et al., 1955	10 mice	XVII	----	1 mg. in peanut oil, 3 inj. at monthly intervals	S.C.	0	4 alive at 255 d.	435 d.

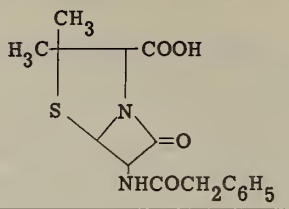
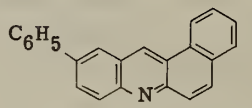
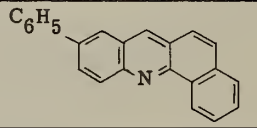
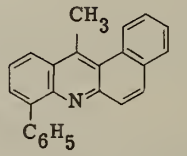
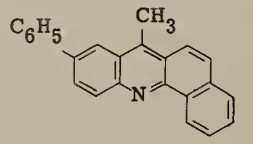
Reference	Animal	Strain or type	Sex	Preparation and dose	Site and route	Animals with tumors	Survival	Duration of experiment
883.--4-METHYL-2-THIOURACIL 								
Hall, 1948	16 rats	Wistar	F	0.01% in drinking water (8 cc. per d. average) for 8 to 42 wks.	P.O.	4[457]	12 alive at 26 wks.	42 wks.
Sanfilippo, 1948	4 guinea pigs	----	----	0.02 g. per 100 g. body wt.	P.O.	0	4 alive	70 d.
Varveri, 1948	8 guinea pigs	----	----	1 mg. per d. in water	P.O.	0	Killed at 73d.	73 d.
Malcolm et al., 1949	3 rats	Wistar substrain	M	0.01% plus 5 μg. d, l-thyroxine daily for 52 wks.	P.O.	0[458]	----	58 wks.
	16 rats	Wistar substrain	M&F	0.01 to 0.05% in the drinking water	P.O.	0[459]	----	122 wks.
Hall and Bielschowsky, 1949	16 rats	Albino	M&F	0.01% in drinking water	P.O.	Tumors[460]	7 alive at 78 wks.	94 wks.
Hill, 1949	5 guinea pigs	----	M	0.05 g. daily	P.O.	0	----	3 mos.
	5 guinea pigs	----	M	0.05 g. daily for 3 mos., and 14 d.	P.O.	0	----	Over 3 mos.
Husing and Loeser, 1949	4 rats	Albino	----	0.116 gm. per kg. aqueous	P.O.[461]	0	----	160 d.
Kabak and Pavlova, 1949	>39 rats	----	M	30 mg. per day for 35 - 70 d., pituitary extract also given	P.O.	0[461a]	----	45 d.
Kleinsorg et al., 1949	12 rats	----	----	0.116 g. per kg. daily	P.O.	0	----	At least 33 d.
Kroon, 1949	Rats	----	----	25 - 75 mg. daily	P.O.	0	----	45 d.
	Guinea pigs	----	----	100 mg. daily	P.O.	0	----	At least 4 wks.
Telo, 1949	2 rabbits	----	----	100 - 200 mg. per d. for 54 d. (total of 8.8 gm.)	P.O.	0	2 alive at 54 d.	54 d.
Bielschowsky and Griesbach, 1950	6 rats	Wistar	M&F	5 - 10 mg. in the diet, daily	P.O.	0[462]	----	----
Crepax, 1950	19 rats	Albino	M	10 mg. per 100 g. body wt. per d.	P.O.[461]	0	----	45 d.
Doniach, 1950	15 rats	Lister Hooded	M&F	Saturated soln. in tap water for 9 - 15 mos.	P.O.	10[463]	12 alive at 12 mos.	15 mos.
Lindner and Voelkel, 1951	6 rats	----	F	25 mg. three times every 14 d.	S.C.	0	----	40 d.
Crepax, 1953	Rats	Albino	F	10 mg. per 100 gm. body wt. in the diet daily, aqueous suspension with gum arabic	P.O.[461]	0[461a]	----	----
Doniach, 1953	20 rats	Lister Hooded	M&F	1 gm. per liter of drinking water	P.O.	19[464]	----	15 mos.

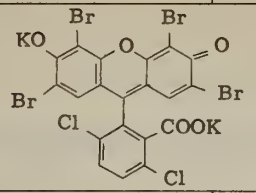
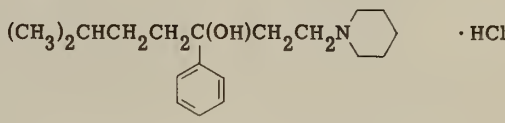
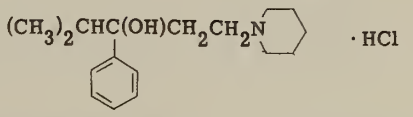
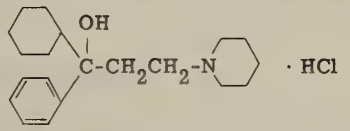
[457] Thyroid adenomas.
[458] Thyroid and parathyroid hyperplasia.
[459] Thyroid and parathyroid hyperplasia; ostentis fibrosa lesions.
[460] Several thyroid adenomas and 2 carcinomas.
[461] Stomach tube.
[461a] No pathological data.
[462] Pronounced thyroid hyperplasia.
[463] Thyroid adenomas.
[464] Adenomas of the thyroid gland.

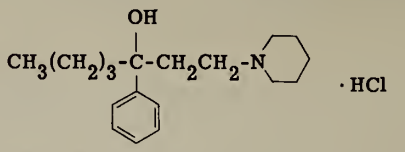
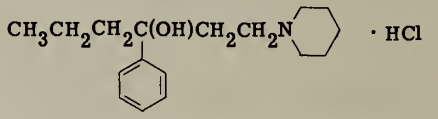
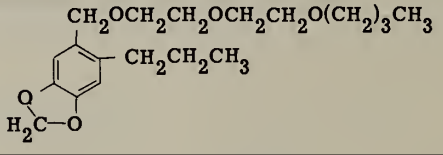
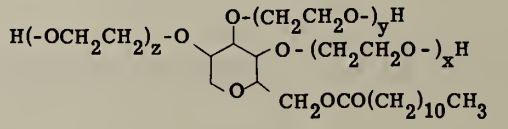
Reference	Animal	Strain or type	Sex	Preparation and dose	Site and route	Animals with tumors	Survival	Duration of experiment
884. --MORPHINE SULFATE  $\cdot 1/2\,H_2SO_4 \cdot 5/2\,H_2O$								
Finnegan et al., 1948	72 rats	Albino	M&F	0.01 - 1.0% in the diet	P.O.	0	----	100 d.
	4 dogs	Mongrel	F	2 or 5 mg. per kg. daily as 4% aqueous soln.	S.C.	0	----	100 d.
Randall and Lehman, 1948	10 rats	----	----	6 mg. per kg. daily for 7 wks.	S.C.	0	----	14 wks.
885. --MORPHOLYLETHYLMORPHINE 								
Chabrier et al., 1950	20 mice	----	----	0.05 g. per kg. daily, 6 d. per wk.	I.P.	0	----	30 d.
886. --NEO-ANTERGAN 								
Ercoli et al., 1948	6 rabbits	----	----	6 - 8 mg. per kg., 5 d. per wk. for 6 wks.	I.V.	0	6 alive at 6 wks.	6 wks.
	10 rats	----	M&F	20 mg. per kg., 5 times a wk. for 3 mos.	P.O.[465]	0	----	3 mos.
887. --NEUTRAL RED 								
Haley and Stolarsky, 1951	3 rabbits	Dutch	F	9.6 mg. per kg. in saline, twice weekly	I.V.	0	----	90 d.
888. --NEUTRAL VIOLET 								
Haley and Stolarsky, 1951	3 rabbits	Dutch	F	3.5 mg. per kg. in saline, twice weekly	I.V.	0	----	90 d.
889. --NICOTINAMIDE 								
De Dominicis, 1949	Guinea pigs	----	----	Single dose of 0.10 gm.	S.C.	0	1 died at 25d.	55 d.

[465] Stomach tube.

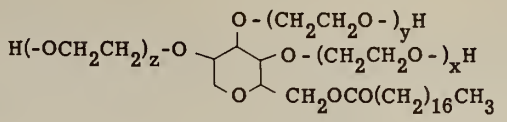
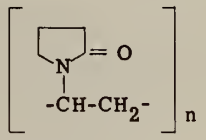
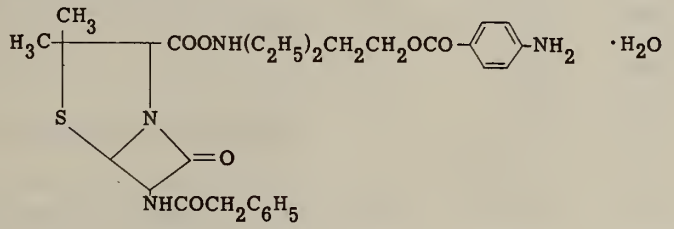
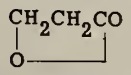
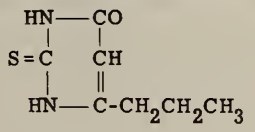
Reference	Animal	Strain or type	Sex	Preparation and dose	Site and route	Animals with tumors	Survival	Duration of experiment
890. --4-NITRO-o-BENZOQUINONE FURAZAN 								
Forni and Tappi, 1950	20 rats	Albino	----	1% benzene solution for 240 d.	Skin	0	----	350 d.
891. --4-NITRO-o-BENZOQUINONE FUROXAN 								
Forni and Tappi, 1950	20 rats	Albino	----	1% benzene soln. for 240 d.	Skin	0	----	350 d.
892. --2'-NITRO-1,2,7,8-DIBENZCARBAZOLE 								
Lacassagne et al., 1955	15 mice	XVII	----	1 mg. in peanut oil, 3 inj. at monthly intervals	S.C.	0	6 alive at 255 d.	425 d.
893. --2-NITRO-2-ETHYL-1,3-PROPANEDIOL BUTYRALDEHYDE ACETAL 								
Draize et al., 1948	60 rats	----	----	Undiluted, daily	Skin	0	----	90 d.
	50 mice	----	----	Undiluted, daily	Skin	0	----	90 d.
894. --5-NITRO-2-FURALDEHYDE-2-(2-HYDROXYETHYL)SEMICARBAZONE 								
Prior and Ferguson, 1950	Rats	----	----	200 mg. per kg. in the diet daily for 2 wks.	P.O.	0	----	7 wks.

Reference	Animal	Strain or type	Sex	Preparation and dose	Site and route	Animals with tumors	Survival	Duration of experiment
895.--PENICILLIN G 								
Roine et al., 1953	7 guinea pigs	----	----	50 mg. per kg. in diet	P.O.	0	All alive at 6 wks.	6 wks.
896.--3-PHENYL-5,6-BENZACRIDINE 								
Zajdela and Buu-Hoi, 1950a	10 mice	----	----	0.5 mg. in peanut oil, single dose	S.C.	0	----	----
897.--3-PHENYL-7,8-BENZACRIDINE 								
Zajdela and Buu-Hoi, 1950a	10 mice	----	----	0.5 mg. in peanut oil, single dose	S.C.	0	----	----
898.--1-PHENYL-10-METHYL-5,6-BENZACRIDINE 								
Zajdela and Buu-Hoi, 1950a	10 mice	----	----	0.5 mg. in peanut oil, single dose	S.C.	0	----	----
899.--3-PHENYL-10-METHYL-7,8-BENZACRIDINE 								
Zajdela and Buu-Hoi, 1950a	10 mice	----	----	0.5 mg. in peanut oil, single dose plus 1 drop of an 0.3% acetone soln., twice weekly until tumor appeared or for at least 6 mos.	S.C., Skin	2 pap., 2 epi.	----	At least 6 mos.
Zajdela and Buu-Hoi, 1950b	Mice	----	----	----	Skin	Tumors	----	----

Reference	Animal	Strain or type	Sex	Preparation and dose	Site and route	Animals with tumors	Survival	Duration of experiment
900.--PHLOXINE 								
Willheim and Ivy, 1953	10 rats	Wistar	M&F	4% of the diet	P.O.	0	----	2 yrs.
901.--1-(N-PIPERIDYL)-6-METHYL-3-PHENYL-3-HEPTANOL HYDROCHLORIDE 								
Cunningham et al., 1949	4 dogs	----	M&F	20 mg. per kg. daily	P.O.	0	----	15 wks.
	20 rats	----	M	40 mg. per kg. daily	I.P.	0	----	16 wks.
	10 mice	----	M	40 mg. per kg. daily	I.P.	0	----	16 wks.
	8 guinea pigs	----	M	40 mg. per kg. daily	I.P.	0	----	16 wks.
902.--1-(N-PIPERIDYL)-4-METHYL-3-PHENYL-3-PENTANOL HYDROCHLORIDE 								
Cunningham et al., 1949	4 dogs	----	M&F	20 mg. per kg. once daily	P.O.	0	----	15 wks.
	20 rats	----	M	50 mg. per kg. once daily	P.O.	0	----	16 wks.
	10 mice	----	M	50 mg. per kg. once daily	I.P.	0	----	16 wks.
	9 guinea pigs	----	M	50 mg. per kg. once daily	I.P.	0	----	16 wks.
903.--3-(N-PIPERIDYL)-1-PHENYL-1-CYCLOHEXYL-1-PROPANOL HYDROCHLORIDE 								
Cunningham et al., 1949	4 dogs	----	M&F	20 mg. per kg. daily	P.O.	0	----	15 wks.
	15 rats	----	M	100 mg. per kg. daily	P.O.	0	----	15 wks.
	10 mice	----	M	100 mg. per kg. daily	P.O.	0	----	15 wks.
	20 rats	----	M	10 mg. per kg. daily	I.P.	0	----	16 wks.
	15 rabbits	----	M	30 mg. per kg. daily	I.P.	0	----	16 wks.

Reference	Animal	Strain or type	Sex	Preparation and dose	Site and route	Animals with tumors	Survival	Duration of experiment
				904. --1-(N-PIPERIDYL)-3-PHENYL-3-HEPTANOL HYDROCHLORIDE 				
Cunningham et al., 1949	4 dogs	----	M&F	20 mg. per kg. daily	P.O.	0	----	15 wks.
	20 rats	----	M	35 mg. per kg. daily	I.P.	0	----	16 wks.
	10 mice	----	M	35 mg. per kg. daily	I.P.	0	----	16 wks.
	8 guinea pigs	----	M	35 mg. per kg. daily	I.P.	0	----	16 wks.
				905. --1-(N-PIPERIDYL)-3-PHENYL-3-HEXANOL HYDROCHLORIDE 				
Cunningham et al., 1949	4 dogs	----	M&F	20 mg. per kg. daily	P.O.	0	----	15 wks.
	20 rats	----	M	50 mg. per kg. daily	I.P.	0	----	16 wks.
	10 mice	----	M	50 mg. per kg. daily	I.P.	0	----	16 wks.
	8 guinea pigs	----	M	50 mg. per kg. daily	I.P.	0	----	16 wks.
				906. --PIPERONYL ETHER BUTOXIDE 				
Draize et al., 1948	50 mice	----	----	5% soln. daily	Skin	0	----	90 d.
	60 rats	----	----	5% soln. daily	Skin	0	----	90 d.
				907. --POLYOXYETHYLENE SORBITAN MONOLAURATE[466] 				
Harris et al., 1951a	14 rats	Sprague-Dawley	M	25% of diet	P.O.	0	6 alive	59 d.
Harris et al., 1951b	36 hamsters	----	M&F	5% in the diet	P.O.	0	14 died	68 d.

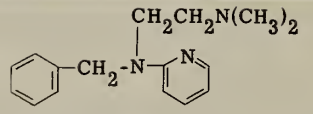
[466] Tween 20.

Reference	Animal	Strain or type	Sex	Preparation and dose	Site and route	Animals with tumors	Survival	Duration of experiment
908. --POLYOXYETHYLENE SORBITAN MONOSTEARATE[466a] 								
Preston et al., 1953	2 Humans	Infants	----	1 gm. daily, 31 or 34 doses	P.O.	0	----	34 d.
909. --POLYVINYL PYRROLIDONE 								
Nelson and Lusky, 1951	6 rabbits	----	M&F	3.5% in distilled water, 10 cc. per kg., 16 injections	I.V.	0	100%	2 mos.
Danneberg, P. (unpub. data)	52 rats	Hybrids	----	200 mg. daily (total dose 200 mg.)	I.V.	0[467]	40 alive at 1 yr.	32 mos.
910. --PROCAINE-PENICILLIN G 								
Elam et al., 1951	50 chicks	NA x SCWL	M&F	53 mg. per kg. of diet	P.O.	0	Some killed at 10 wks.	32 wks.
911. --β-PROPIOLACTONE 								
Boyland and Sargent, 1951	10 mice	C57	----	0.75 mg. per ml. in saline, 0.05 ml. of soln. in 40 sites	Intradermal	0	----	----
912. --6-n-PROPYL-2-THIOURACIL 								
Chamorro, 1948	14 rats	K	F[468]	0.5 mg. daily, 6 d. per wk. for 6 - 10 wks.	S.C.	1[469]	----	6 - 10 wks.
Goddard, 1948	Rats	Carworth Albino	M&F	10 - 30 mg. per kg. per d.	S.C.	0[470]	Some died early	101 d.

[466a] Tween 60.
[467] Uterine carcinoma after 12 months, spontaneous.
[468] 3 castrated.
[469] Tumor in thyroid of 1 castrate rat described as epithelioma.
[470] Hyperplastic thyroids.

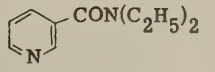
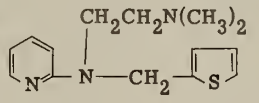
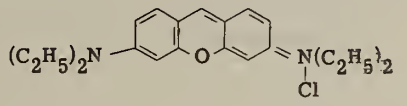
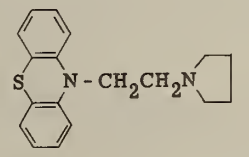
Reference	Animal	Strain or type	Sex	Preparation and dose	Site and route	Animals with tumors	Survival	Duration of experiment
912.--6-n-PROPYL-2-THIOURACIL--Continued								
Gyorgy et al., 1948	10 rats	----	M	0.05% in the diet	P.O.	0	100%	150 d.
Sellers and Ferguson, 1949	Rats	Wistar	----	0.02% in the diet	P.O.	0[470a]	----	Many mos.
Glickman and Pruzansky, 1950	170 rats	Albino	----	0.03% or 0.1% in the diet	P.O.	0	----	97 d.
Mitchell, 1950	40 hamsters	----	M&F	0.05% in drinking water for 72 d., 0.075% for 114 d., 0.1% for 263 d.	P.O.	0[471]	20 sacrificed at 186 d.	449 d.
Rodriguez and Martinez, 1950	Rats[472]	----	F	25 mg. per rat per d. for 3 mos.	P.O.	0	----	12 mos.
D'Angelo et al., 1951	70 guinea pigs	----	F	0.1% in the diet	P.O.	0[473]	----	160 d.
Martinez, 1951	7 rats[474]	----	M	48 gm. per rat per d., given insulin and penicillin	P.O.	0[474a]	----	95 d.
Sellers and You, 1951	108 rats	Wistar	M&F	0.02% in the diet, various diets	P.O.	0	Sacrificed at intervals	15 mos.
	10 rats	Wistar	F	0.02% in basal diet	P.O.	0	Sacrificed	6 mos.
Brown and Young, 1952	30 guinea pigs	Louisville Stock	M	30 mg. daily per kg. body wt. in dilute ammonia	P.O.	0	Several killed early	16 wks.
Danowski et al., 1952	37 rats	Wistar	F	0.5% in the diet	P.O.	0[473]	----	48 d.
Moore et al., 1953	4 mice	A	M	0.8% in the diet	P.O.	Tumors[475]	----	534 d.
Sellers et al., 1953	70 rats	Wistar	M&F	0.02% in the diet for 15 mos., plus 0.02% dried thyroid	P.O.	Tumors[476]	----	Over 15 mos.
	70 rats	Wistar	M&F	0.02% in the diet for 15 mos.	P.O.	Tumors[477]	----	Over 15 mos.
	70 rats	Wistar	M&F	0.02% in the diet for 15 mos., plus 0.02% sodium iodide	P.O.	Tumors[477]	----	Over 15 mos.
Van Dyke, 1953	48 rats	Wistar	F	0.2% in the diet, 2 to 14 mos.	P.O.	Tumors[478]	Killed at various times	14 mos.

913.--PYRIBENZAMINE

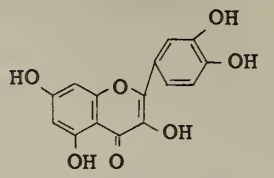
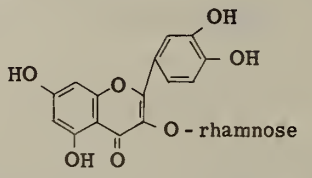
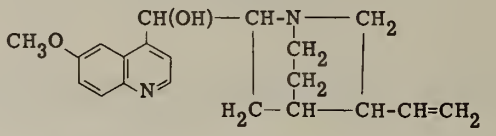
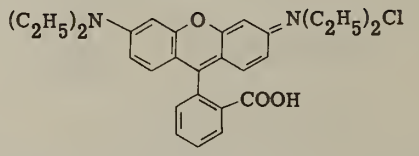
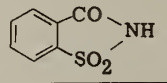


Ercoli et al., 1948	10 rats	----	M&F	20 mg. per kg., 5 times a wk. for 3 mos.	P.O.[465]	----	----	3 mos.
	6 rabbits	----	----	6 - 8 mg. per kg. 5 d. per wk. for 6 wks.	I.V.	0	3 alive at 6 wks.	6 wks.
Castillo et al., 1949	30 rats	Albino	M	0.00625 - 0.1% in the diet	P.O.	0	----	55 d.

[465] Stomach tube.
[470a] No general autopsy. Exophthalmos noted.
[471] Papillary hyperplasia of thyroid.
[472] 95% of the pancreas and both ovaries removed.
[473] Hyperplasia of the thyroid.
[474] Pancreatectomized.
[474a] No pathology report.
[475] 3 adenomas of anterior pituitary, 4 carcinomas of thyroid.
[476] Thyroid adenomas and 2 chromophobic adenomas.
[477] Thyroid adenomas.
[478] 24 adenomas (4 solid and 20 cystic type).

Reference	Animal	Strain or type	Sex	Preparation and dose	Site and route	Animals with tumors	Survival	Duration of experiment
914.--PYRIDINE								
Baxter, 1948	Rats	Sprague-Dawley, Sherman	M	0.1% in the diet for 4 mos., various diets	P.O.	0[479]	----	6 mos.
Baxter, 1949	Rats	Sherman	M	1.0% in the diet	P.O.	0	----	Over 1 mo.
Dinning et al., 1950	8 rats	Sprague-Dawley	----	10% in the diet for 35 d.	P.O.	0	3 died	35 d.
915.--PYRIDINE CITRATE $C(OH)(COOH)(CH_2COOH)_2$								
Baxter, 1948	Rats	Sprague-Dawley, Sherman	M	0.34 - 1.0% in the diet for 4 mos., various diets	P.O.	0[479]	----	6 mos.
916.--PYRIDINE-3-DIETHYLCARBONAMIDE 								
Boyland and Sargent, 1951	9 mice	B	----	5.0 mg. per ml. in water, 0.05 ml. of soln. in 36 sites	Intradermal	0	----	----
917.--N-(2-PYRIDYL)-N-(2-THENYL)-N',N'-DIMETHYLETHYLENEDIAMINE[480] 								
Ercoli et al., 1948	6 rabbits	----	----	6 - 8 mg. per kg., 5 d. per wk. for 6 wks.	I.V.	0	3 alive at 6 wks.	6 wks.
918.--PYRONINE 								
Willheim and Ivy, 1953	10 rats	Wistar	M&F	4% of the diet	P.O.	0	----	2 yrs.
919.--β-PYRROLIDINE-ETHYL-PHENOTHIAZINE 								
Vander Brook et al., 1948	50 rats	White	M	10 - 300 mg. per kg. body wt.	P.O.[481]	0	----	4.5 wks. or 10 wks.

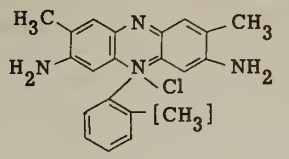
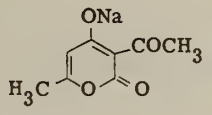
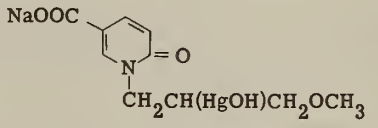
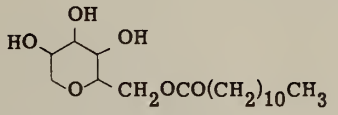
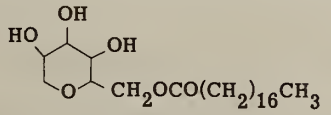
[479] Liver cirrhosis with large regenerating nodules.
[480] W-53.
[481] Stomach tube.

Reference	Animal	Strain or type	Sex	Preparation and dose	Site and route	Animals with tumors	Survival	Duration of experiment
920.--QUERCETIN 								
Ambrose et al., 1952	30 rats	Albino	M&F	0.25 - 1.0% in the diet	P.O.	0	25 alive	410 d.
921.--QUERCITRIN 								
Ambrose et al., 1952	30 rats	Albino	M&F	0.25 - 1.0% in the diet	P.O.	0	23 survived	410 d.
922.--QUININE 								
Ruedi et al., 1952	28 guinea pigs	----	----	9.6 - 112 gm. per kg. body wt. (total dose)	P.O.	0[481a]	5 alive at 522 d.	522 d.
923.--RHODAMINE B 								
Umeda, 1952	20 rats	Saitama	----	1 cc. of 0.05% (increasing to 0.15%) aqueous soln., 2 - 3 times a wk. throughout experiment.	S.C.	Tumors[482]	10 died early	630 d.
Willheim and Ivy, 1953	10 rats	Wistar	M&F	4% in the diet	P.O.	0	----	2 yrs.
924.--SACCHARIN 								
Fitzhugh et al., 1951	100 rats	Osborne-Mendel	M&F	0.01 - 5.0% in the diet	P.O.	0[483]	----	2 yrs.

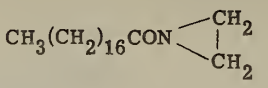
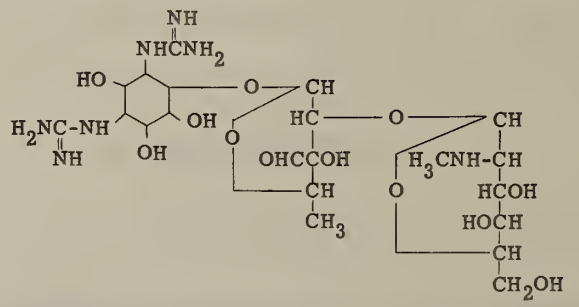
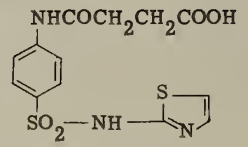
[481a] Pathological study confined to the ear.

[482] 5 fibrosarcoma at site of injection.

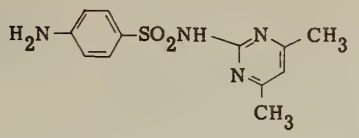
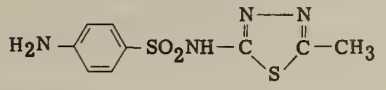
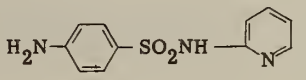
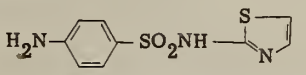
[483] 7 lymphosarcomas thought consistent with spontaneous incidence in these rats.

Reference	Animal	Strain or type	Sex	Preparation and dose	Site and route	Animals with tumors	Survival	Duration of experiment
925.--SAFRANINE 								
Haley and Stolarsky, 1951	3 rabbits	Dutch	F	2.6 mg. per kg. in saline, twice weekly	I.V.	0	----	90 d.
926.--SODIUM DEHYDROACETATE 								
Spencer et al., 1950b	3 monkeys	Rhesus	----	0.05 - 0.20 gm. per kg. in 10% aqueous soln.	P.O.[481]	0	----	1 yr.
927.--SODIUM N-(2-HYDROXYMERCURI-3-METHOXYPROPYL)-2-PYRIDONE-5-CARBOXYLATE[484] 								
Minatoya and Hoppe, 1951	3 dogs	Mongrel	F	2 or 4 mg. Hg./kg. daily, 3 d. per wk.	S.C.	0	100%	6 wks.
928.--SORBITAN MONOLAURATE[485] 								
Harris et al., 1951a	14 rats	Sprague-Dawley	M	25% of diet	P.O.	0	13 alive	59 d.
	30 rats	Sprague-Dawley	M&F	25% in the diet	P.O.	0	11 alive	10 wks.
Harris et al., 1951b	72 hamsters	----	M&F	5 or 15% in the diet	P.O.	0	12 died	68 d.
929.--SORBITAN MONOSTEARATE[486] 								
Preston et al., 1953	2 humans	Children	----	4 gm. daily, 32 or 37 doses	P.O.	0	----	41 d.

[481] Stomach tube.
[484] Trade name: Therargidone; also contains theophylline.
[485] Span 20.
[486] Span 60.

Reference	Animal	Strain or type	Sex	Preparation and dose	Site and route	Animals with tumors	Survival	Duration of experiment
930.--STEAROYL ETHYLENEIMINE[487] 								
Hendry et al., 1951c	10 rats	Albino stock	M&F	10 mg. per 100 g. body wt. as a 2% soln. in arachis oil twice weekly for 5 wks.	S.C.	5 sarc.	----	11 mos.
931.--STREPTOMYCIN 								
Quagliariello and Ragno, 1950	9 rats	----	M&F	0.01 mg. per g. body wt. daily, 3 rats had 0.02 mg. per g. body wt.	I.M.	0[474a]	9 alive	40 d.
Boyland and Sargent, 1951	10 mice	B	----	50 or 25 mg. per ml. in water, 0.05 ml. of soln. in 5 sites	Intradermal	0	----	At least 48 d.
Ruedi et al., 1952	9 guinea pigs	----	----	13.7 - 55.8 gm. per kg. body wt. (total dose)	----	0[481a]	5 survived 33 d.	160 d.
932.--STREPTOMYCIN SULPHATE $Base_2 \cdot 3H_2SO_4$								
Vanderhaeghe, 1950	Rabbits	----	----	Doses ranging from 100 to 500 mg. per kg., 3 injections per d. for more than 35 d.	S.C.	0	----	At least 35 d.
Roine et al., 1953	8 guinea pigs	----	----	50 mg. per kg. in diet	P.O.	0	All alive at 6 wks.	6 wks.
933.--2-(N^4-SUCCINYL-SULFANILAMIDO)-THIAZOLE 								
Handler and Follis, 1948	16 rats	Vanderbilt	M	1.0% in the diet, choline deficient	P.O.	0	100%	120 d.
Jones et al., 1949	Rats	Albino	M&F	5 gm. per 100 gm. diet	P.O.	0	----	6 wks.
Roine et al., 1953	4 guinea pigs	----	----	1% in diet	P.O.	0	All alive at 6 wks.	6 wks.

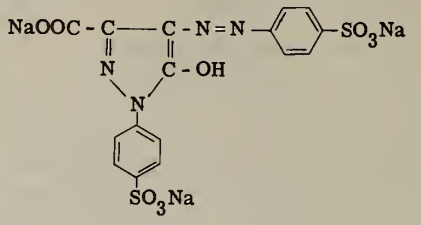
[474a] No pathology report.
[481a] Pathological study confined to the ear.
[487] Impure.

Reference	Animal	Strain or type	Sex	Preparation and dose	Site and route	Animals with tumors	Survival	Duration of experiment
934.--SULFAMETHAZINE 								
P'an, 1948	19 rats[488]	----	M	0.2% by weight in the diet	P.O.	0	----	63 d.
Hansen and Bichel, 1952	30 rats	Wistar	----	50 - 500 mg. tablet implanted	S.C.	Tumors[489]	6 died by 14 mos.	2 yrs.
935.--SULFAMETHYLIZOLE 								
Hansen and Bichel, 1952	20 mice	Rfc	M&F	0.013 gm., 12 inj. 3 times weekly during 3 wks.	S.C.	Tumors[490]	6 died by 10 mos.	13 mos.
	20 mice	Rf1	----	12 inj., 0.013 gm. each, 3 times weekly	S.C.	Tumors[490]	----	12 mos.
936.--SULFAPYRIDINE 								
Haerem, 1948	40 rats	----	----	0.015 gm. in lard, 2 inj. at different sites	S.C.	3 sarc.[491]	15 alive at 21 mos.	21 mos.
Figge et al., 1949	Mice	C3H, C57, A	----	Various	P.O.	0	----	5 yrs.[492]
937.--SULFATHIAZOLE 								
Figge et al., 1949	Mice	C3H, C57, A	----	Various	P.O.	0	----	5 yrs.[492]
Hansen and Bichel, 1952	10 rats	Wistar	M&F	1 inj. of 0.1 gm.	S.C.	Tumors[493]	5 alive at 18 mos.	18 mos.
	18 mice	AKA	----	1 inj. of 0.01 gm.	S.C.	Tumors[494]	11 died at 8 mos.	19 mos.
	10 rats	Wistar	----	0.1 gm., 1 inj.	S.C.	Tumors[495]	----	18 mos.
	12 mice	AKa	----	0.2 ml. of a 1.65% soln. daily	P.O.[496]	0[497]	----	16 mos.
	18 mice	AKa	----	1 inj. of 0.01 gm.	S.C.	0[498]	----	Over 16.5 mos.
	12 mice	AKa	M&F	0.2 ml. of a 1.65% soln. in NaOH daily for 2 wks.	P.O.[496]	0[499]	----	16 mos.

[488] 8 hypophysectomized.
[489] 1 with lymphosarcoma, 1 with adenocarcinoma, 1 with spindle cell sarcoma. No tumors in the controls.
[490] 3 with round cell sarcomas, 1 with plasmacytoma, 1 with lung adenoma (no tumors in the control group).
[491] Spindle cell occurring at 16, 19 and 20 months.
[492] 8 generations.
[493] 1 with lymphosarcoma, 1 with renal carcinoma, 1 with spindle cell sarcoma (retroperitoneal).
[494] 11 with leukemia (control group of 18 mice had 11 with leukemia, but appeared some 3 months later).
[495] 1 with renal carcinoma, 1 with lymphosarcoma, 1 with spindle cell sarcoma, 1 with sarcoma in the controls.
[496] Stomach tube.
[497] 9 with leukemia, 7 in the controls.
[498] 14 with leukemia, 11 in the controls.
[499] 9 with leukemia (7 in the controls, but occurring 2 months later).

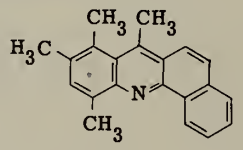
Reference	Animal	Strain or type	Sex	Preparation and dose	Site and route	Animals with tumors	Survival	Duration of experiment

938.--TARTRAZINE[500]



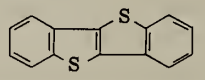
Willheim and Ivy, 1953	10 rats	Wistar	M&F	4% of the diet	P.O.	0	----	2 yrs.

939.--1,3,4,10-TETRAMETHYL-7,8-BENZACRIDINE[501]



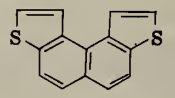
Lacassagne et al., 1947	10 mice	XVII	M&F	0.25 ml. of a 1% soln. in olive oil, twice at 10 days intervals	S.C.	1 sarc.	----	151 d.

940.--THIONAPHTHENO [2,3;3',2'] THIONAPHTHENE[517]



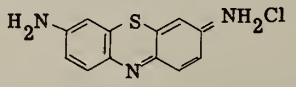
Ranadive (unpub. data)	12 mice	Swiss	F	0.002 mg. in 0.2 ml. of tricaprylin per animal, 1 inj.	S.C.	0	11 alive at 6 mos.	in progress
	12 mice	Swiss	F	0.5% in benzene twice a week	Skin	0	10 alive at 6 mos.	In progress

941.--THIONAPHTHENO [4,5;4',5'] THIONAPHTHENE[518]



Ranadive (unpub. data)	12 mice	Swiss	F	0.002 mg. in 0.2 ml. of tricaprylin per animal, 1 inj.	S.C.	0	12 alive at 1 yr.	15 mos.
	12 mice	Swiss	F	0.5% in benzene twice a wk.	Skin	0	8 alive at 1 yr.	15 mos.

942.--THIONINE



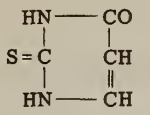
Haley and Stolarsky, 1951	3 rabbits	Dutch	F	1 mg. per kg. in saline, twice weekly	I.V.	0	----	90 d.

[500] FD & C Yellow 5.

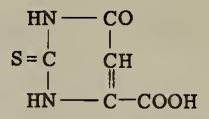
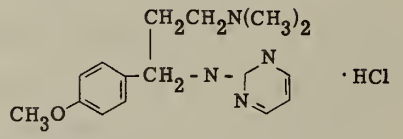
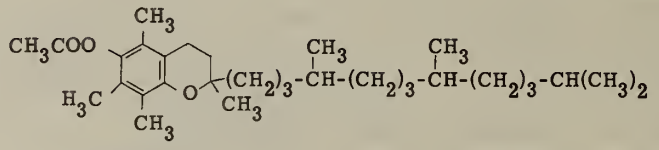
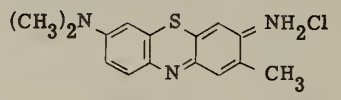
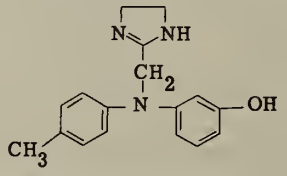
[501] Called 5,7,8,9-Tetramethyl-3,4-benzacridine in 2nd Edition.

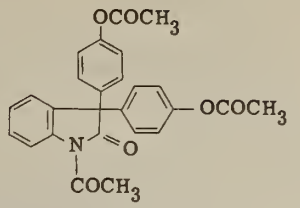
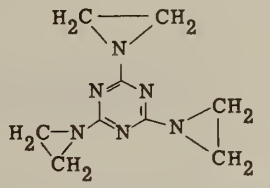
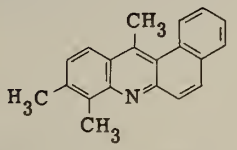
[517] Compound synthesized by Miss Bhavsar according to Baker et al., J.C.S. 3165 (1953).

[518] Compound synthesized by Ghaisas, Rabindran and Tilak, Proc. Indian Acad. Sci., 37 A, 114 (1953).

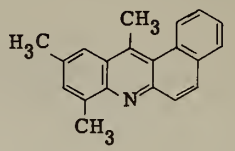
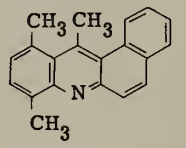
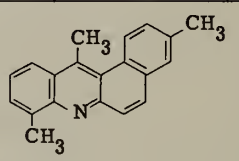
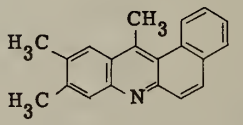
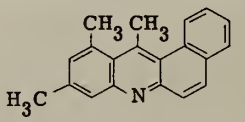
Reference	Animal	Strain or type	Sex	Preparation and dose	Site and route	Animals with tumors	Survival	Duration of experiment
943. --THIOURACIL 								
Gorbman, 1947	81 mice	A,C_{57}, I	----	0.1% in the diet	P.O.	Tumors[502]	----	566 d.
Dalton et al., 1948	Mice	C3H	F	0.375 or 0.5% in the diet	P.O.	0[503]	Killed at intervals	Over 300 d.
Handler and Follis, 1948	16 rats	Vanderbilt	M	0.15 or 0.25% in the diet, choline deficient	P.O.	0[504]	----	At least 40 d.
Paschkis et al., 1948	20 rats	Sherman and Wistar	----	0.05 or 0.1% in drinking water throughout	P.O.	Tumors[505]	----	884 d.
Steiner et al., 1948	3 dogs	----	----	1.0 gm. daily	P.O.	0	----	1 yr.
Dubnik et al., 1949	73 mice	----	F	0.375% gm. per kg. for 26 wks., followed by 0.5 gm. per kg.	P.O.	0[506]	----	At least 436 d.
Ferguson and Sellers, 1949	16 rats	----	M&F	1.0% in drinking water	P.O.	0	----	6 wks.
Laqueur, 1949	111 rats	Stanford	M&F	0.1% in the diet for 10 mos.	P.O.	0[508]	----	10 mos.
Steiner et al., 1949	3 dogs	Mongrel	----	1.0 gm. daily in the diet for 14 to 15 mos.	P.O.	0[509]	----	15 mos.
Dalton et al., 1950	52 mice	C	M&F	0.375% in the diet for 4 mos. followed by 0.5% (until death)	P.O.	0[510]	----	782 d.
Leathem and Barken, 1950	Rats	----	M	0.1% in the diet	P.O.	0[509]	----	8 mos.
Money and Rawson, 1950	120 rats	Sprague-Dawley	M	0.1% in drinking water	P.O.	Tumors[511]	----	767 d.
Morris et al., 1950b	65 mice	C	F	0.37% in the diet for 26 wks., then 0.5%	P.O.	0[512]	----	Over 600 d.
Paschkis et al., 1951	9 rats	Wistar	M	0.05% in drinking water	P.O.	0[509]	----	35 d.
Paschkis and Cantarow, 1951	9 rats	Wistar	M	0.05% in drinking water	P.O.	0[509]	----	35 d.
Zarrow and Zarrow, 1951	20 rats	Harvard Wistar	M	1.0% in drinking water for 12 wks., some also given ACTH	P.O.	0[513]	----	12 wks.
Clausen, 1953	Rats	Sprague-Dawley	M	0.1% in drinking water	P.O.	0[514]	----	600 d.
Juhn, 1953	1 Fowl	Brown Leghorn	F	0.5% in the diet	P.O.	0[515]	----	6 yrs.
Money et al., 1953	81 rats	Sprague-Dawley	M	0.1% in drinking water (until autopsy)	P.O.	Tumors[516]	----	700 d.
O'Neal and Heinbecker, 1953	Rats	----	F	1% in drinking water for 30 d.	P.O.	0	----	30 d.

[502] Adenomas of the thyroid.
[503] Hyperplastic thyroid changes and "thyroid tissue nodules" in lungs.
[504] Hyperplasia of thyroid.
[505] 11 with thyroid adenomas, 1 with thyroid carcinoma.
[506] Nodular hyperplasia of the thyroid. Thyroid metastases of the lungs.
[508] Nodular hyperplasia of the thyroid in 37 rats.
[509] Hyperplasia of thyroid.
[510] Nodular hyperplasia of the thyroid, 1 with pulmonary metastases of thyroid tissue.
[511] Various types of thyroid adenomas.
[512] 2 with thyroid nodules (more present in untreated controls).
[513] Increased weight of thyroid glands.
[514] 6 rats with chronic thyroiditis, Hashimoto type.
[515] Thyroid enlarged, histology not described.
[516] 100% with thyroid tumors.

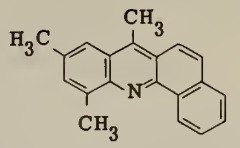
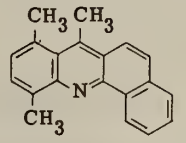
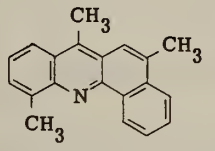
Reference	Animal	Strain or type	Sex	Preparation and dose	Site and route	Animals with tumors	Survival	Duration of experiment
944.--2-THIOURACIL-4-CARBOXYLIC ACID 								
Miller and Jung, 1952	6 rats	----	----	0.5 g. per kg. for 92 d.	P.O.	0	----	92 d.
945.--THONZYLAMINE HYDROCHLORIDE 								
Reinhard and Scudi, 1950	4 dogs	----	M	20 or 40 mg. per kg. daily	P.O.	0	----	1 yr.
946.--dl-α-TOCOPHEROL ACETATE 								
Aaes-Jørgensen et al., 1951	16 rats	----	F	0.02% in the diet	P.O.	0	10 alive	10 wks.
947.--TOLUIDINE BLUE 								
Haley and Stolarsky, 1951	3 rabbits	Dutch	F	1.3 mg. per kg. in saline, twice weekly	I.V.	0	----	90 d.
948.--2-(N-p'-TOLYL-N-(m'-HYDROXYPHENYL)-AMINOMETHYL)-IMIDAZOLINE 								
Trapold et al., 1950	11 dogs	Mongrel	M&F	0.5% aqueous soln. twice daily, 20-60 mg.	P.O.	0	2 died during 12 wks.	Over 12 wks.

Reference	Animal	Strain or type	Sex	Preparation and dose	Site and route	Animals with tumors	Survival	Duration of experiment
949.--TRIACETYL DIPHENYL ISATIN 								
Woislawski et al., 1953	3 dogs	----	----	50 - 150 mg. daily in the diet	P.O.	0	----	1 yr.
	36 rats	Albino	M&F	0.05 or 0.07% in the diet	P.O.	0	----	1 yr.
	40 rats	----	F	0.05 - 1.0% in the diet for 1 mo.	P.O.	0	14 died	1 mo.
950.--TRIETHYLENE MELAMINE 								
Boyland and Sargent, 1951	10 mice	CBA	----	0.0015 mg. per ml. in water, 0.05 ml. of soln. in 1, 2 or 4 sites	Intradermal	0	----	At least 30 d.
Hendry et al., 1951c	20 mice	Albino stock	M&F	0.025 mg. per 20 gm. body wt. once weekly for 30 mos.	S.C.	0	10 alive during 1st mo.	13 mos.
	10 mice	A	M	0.0075 mg., 10 inj. on alternate days	I.P.	8[519]	----	100 d.
Kraus et al., 1951	136 mice	Swiss	F	0.25 - 80 mg. per kg., single inj. of saline	I.P.	0	74 died at 31 d.	31 d.
	36 mice	Swiss	F	0.5 - 10 mg. per kg. in saline, 2 doses	I.P.	0	15 died by 31 d.	31 d.
951.--1,2,10-TRIMETHYL-5,6-BENZACRIDINE 								
Zajdela and Buu-Hoi, 1950a	10 mice	----	----	0.5 mg. in peanut oil, single dose plus 1 drop of an 0.3% acetone soln., twice weekly until tumor appeared or for at least 6 mos.	S.C. Skin	0	----	At least 6 mos.

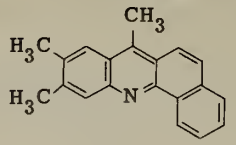
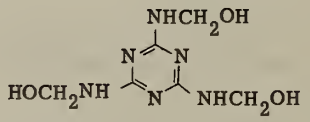
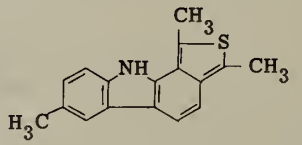
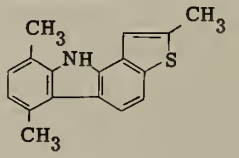
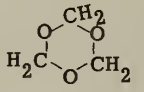
[519] Pulmonary adenomas. (In 15 controls only 2 mice developed pulmonary adenomas).

Reference	Animal	Strain or type	Sex	Preparation and dose	Site and route	Animals with tumors	Survival	Duration of experiment
952.--1,3,10-TRIMETHYL-5,6-BENZACRIDINE[520] 								
Lacassagne et al., 1947	10 mice	XVII	M&F	0.25 ml. of a 1% soln. in olive oil, twice at 10 d. intervals	S.C.	1[521]	----	186 d.
953.--1,4,10-TRIMETHYL-5,6-BENZACRIDINE 								
Zajdela and Buu-Hoi, 1950a	10 mice	----	----	0.5 mg. in peanut oil, single dose plus 1 drop of an 0.3% acetone soln., twice weekly until tumor appeared or for at least 6 mos.	S.C. Skin	0	----	6 mos.
954.--1,10,3'-TRIMETHYL-5,6-BENZACRIDINE 								
Lacassagne et al., 1947	10 mice	XVII	M&F	1 mg. in oil	S.C.	1 sarc.	----	352 d.
955.--2,3,10-TRIMETHYL-5,6-BENZACRIDINE 								
Zajdela and Buu-Hoi, 1950a	10 mice	----	----	0.5 mg. in peanut oil, single dose plus 1 drop of an 0.3% acetone soln., twice weekly until tumor appeared or for at least 6 mos.	S.C. Skin	5 sarc.[522]	----	At least 6 mos.
Zajdela and Buu-Hoi, 1950b	Mice	----	----	----	S.C.	Sarc.	----	----
956.--2,4,10-TRIMETHYL-5,6-BENZACRIDINE 								
Zajdela and Buu-Hoi, 1950a	10 mice	----	----	0.5 mg. in peanut oil, single dose plus 1 drop of an 0.3% acetone soln., twice weekly until tumor appeared or for at least 6 mos.	S.C. Skin	0	----	At least 6 mos.

[520] Called 5,7,9-trimethyl-1,2-benzacridine in 2nd Edition.
[521] Lung adenomas.
[522] Latent period 156 days mean.

Reference	Animal	Strain or type	Sex	Preparation and dose	Site and route	Animals with tumors	Survival	Duration of experiment
957.--1,3,10-TRIMETHYL-7,8-BENZACRIDINE[523] 								
Lacassagne et al., 1947	10 mice	XVII	M&F	0.25 ml. of a 1% soln. in olive oil, twice at 10 d. intervals	S.C.	Tumors[524]	----	522 d.
958.--1,4,10-TRIMETHYL-7,8-BENZACRIDINE 								
Zajdela and Buu-Hoi, 1950a	10 mice	----	----	0.5 mg. in peanut oil, single dose plus 1 drop of an 0.3% acetone soln. twice weekly until tumor appeared or for at least 6 mos.	S.C. Skin	3 pap., 3 epi.[525]	----	At least 6 mos.
Zajdela and Buu-Hoi, 1950b	Mice	----	----	----	Skin	Tumors	----	----
959.--1,6,10-TRIMETHYL-7,8-BENZACRIDINE 								
Zajdela and Buu-Hoi, 1950a	10 mice	----	----	0.5 mg. in peanut oil, single dose plus 1 drop of an 0.3% acetone soln., twice weekly until tumor appeared or for at least 6 mos.	Skin S.C.	3 pap., 2 epi.[526]	----	At least 6 mos.
Zajdela and Buu-Hoi, 1950b	Mice	----	----	----	Skin	Tumors	----	----

[523] Called,5,7,9-trimethyl-3,4-benzacridine in 2nd Edition.
[524] 4 with sarcoma and 2 with lung tumors.
[525] Papilloma, latent period 162 days mean. Epithelioma, latent period 172 days mean.
[526] Papilloma, latent period 149 days mean. Epithelioma, latent period 169 days mean.

Reference	Animal	Strain or type	Sex	Preparation and dose	Site and route	Animals with tumors	Survival	Duration of experiment
960.--2,3,10-TRIMETHYL-7,8-BENZACRIDINE 								
Zajdela and Buu-Hoi, 1950a	10 mice	----	----	0.5 mg. in peanut oil, single dose plus 1 drop of an 0.3% acetone soln., twice weekly until tumor appeared or for at least 6 mos.	S.C. Skin	6 pap., 5 epi.[527]	----	At least 6 mos.
Zajdela and Buu-Hoi, 1950b	Mice	----	----	----	Skin	Tumors	----	----
961.--TRIMETHYLOLMELAMINE 								
Hendry et al., 1951a	Mice	Stock	M&F	1.25 mg. daily (5 d. per wk.) for 50 or 70 wks.	S.C.	0[528]	23 alive at 9 mos.	9 mos.
	10 rats	Albino stock	----	8 daily doses of 50 mg. per 100 g. body wt.	S.C.	0[529]	----	22 mos.
	10 rats	Albino stock	----	200 mg. per 100 g. body wt. once	S.C.	1 sarc.[530]	----	22 mos.
	10 rats	Albino stock	----	100 mg. per 100 g. body wt. once	I.P.	0[531]	----	22 mos.
962.--2',5',7-TRIMETHYL-3',4',1,2-THIOPHENOCARBAZOLE 								
Lacassagne et al., 1955	10 mice	XVII	----	1 mg. in peanut oil, 3 inj. at monthly intervals	S.C.	0	5 alive at 210 d.	475 d.
963.--5',5,8-TRIMETHYL-3',2',1,2-THIOPHENOCARBAZOLE 								
Lacassagne et al., 1955	10 mice	XVII	----	1 mg. in peanut oil, 3 inj. at monthly intervals	S.C.	0	4 alive at 260 d.	325 d.
964.--TRIOXANE 								
Piette, 1948	14 rats	----	----	0.10 g. per d. in food	P.O.	0	10 alive at 30 d.	75 d.

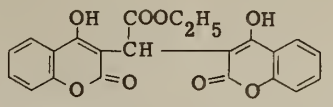
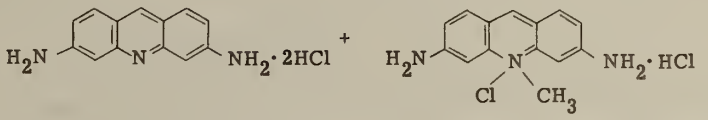
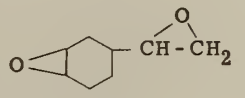
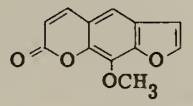
[527] Papilloma, latent period 163 days mean. Epithelioma, latent period 174 days mean.

[528] 1 with lymphoid leukemia, probably spontaneous.

[529] 1 with lymphoid leukemia at 17 months, probably spontaneous.

[530] At 20 months.

[531] An abdominal "tumor mass" at 17 months.

Reference	Animal	Strain or type	Sex	Preparation and dose	Site and route	Animals with tumors	Survival	Duration of experiment
965.--TROMEXAN 								
Hueck, 1951	3 rats	----	M	In powder form, total of 115 mg.	P.O.	0	Killed at 6 wks.	6 wks.
966.--TRYPAFLAVINE 								
Ezeyza, 1952b	24 rats	----	M&F	1 mg. in 0.4 cc. of olive oil (total dose about 40 mg.)	S.C.	1 sarc.[532]	3 alive at 20 mos.	20 mos.
967.--VINYLCYCLOHEXENE DIOXIDE 								
Rose et al., 1950	Rats & mice	----	----	----	----	Tumors[533]	----	1 yr.
Hendry et al., 1951b	20 mice	Stock	M	Approximately 16 mg. 5 times weekly for 12 mos.	Skin	4 epi., 3 sarc.[534]	9 died	21 mos.
	14 rats	Albino stock	M&F	25 mg. per 100 g. body wt. as 5% in arachis oil twice weekly for 10 wks.	I.P.	1[535]	6 alive at 21 mos.	At least 21 mos.
968.--XANTHOTOXINE[536] 								
Elwi, 1950	10 guinea pigs	----	----	2 mg. per kg. 6 d. per wk. for 5 mos., or 1 mg. per kg. tablets	P.O.	0	----	5 mos.

[532] At site of injection, appeared 14 months after 1st injection. Successfully transplanted.
[533] 1 sarcoma in rats and several "malignant tumors" in mice.
[534] One with metastases.
[535] Mixed cell sarcoma, tumor transplanted.
[536] Crystalline substance from fruit of Ammi magus Linn.

MISCELLANEOUS

Reference	Animal	Strain or type	Sex	Preparation and dose	Site and route	Animals with tumors	Survival	Duration of experiment
969. --BACITRACIN								
Payne et al., 1951	33 mice	White	----	31,250 - 125,000 units per kg. daily for 30 d.	P.O.	0	----	30 d.
	Dogs	----	----	5,000 - 25,000 units per kg. for 30 d.	P.O.	0	----	30 d.
970. --DIGENTISIC ACID [537]								
Fabinyi-Szebehely et al., 1953	10 mice	----	F	0.01 - 0.02 ml. per gm. body wt. daily for 30 d.	P.O.	0	----	30 d.
	10 rabbits	----	----	0.01 - 0.02 ml. per gm. body wt. daily for 30 d.	P.O.	0	----	30 d.
	10 rats	----	----	0.01 - 0.02 ml. per gm. body wt. daily for 30 d.	P.O.	0	----	30 d.
	10 guinea pigs	----	----	0.01 - 0.02 ml. per gm. body wt. daily for 30 d.	P.O.	0	----	30 d.
971. --DIGENTISIC-GALLIC ACID								
Fabinyi-Szebehely et al., 1953	10 mice	----	F	0.01 - 0.02 ml. per gm. body wt. daily for 30 d.	P.O.	0	----	30 d.
	10 rabbits	----	----	0.01 - 0.02 ml. per gm. body wt. daily for 30 d.	P.O.	0	----	30 d.
	10 rats	----	----	0.01 - 0.02 ml. per gm. body wt. daily for 30 d.	P.O.	0	----	30 d.
	10 guinea pigs	----	----	0.01 - 0.02 ml. per gm. body wt. daily for 30 d.	P.O.	0	----	30 d.
972. --DI-p-HYDROXYBENZOIC ACID								
Fabinyi-Szebehely et al., 1953	10 mice	----	F	0.01 - 0.02 ml. per gm. body wt. daily for 30 d.	P.O.	0	----	30 d.
	10 rabbits	----	----	0.01 - 0.02 ml. per gm. body wt. daily for 30 d.	P.O.	0	----	30 d.
	10 rats	----	----	0.01 - 0.02 ml. per gm. body wt. daily for 30 d.	P.O.	0	----	30 d.
	10 guinea pigs	----	----	0.01 - 0.02 ml. per gm. body wt. for 30 d.	P.O.	0	----	30 d.

[537] "Polycondensed methylenedigentisic acid".

Reference	Animal	Strain or type	Sex	Preparation and dose	Site and route	Animals with tumors	Survival	Duration of experiment
973. --DI-β-RESORCYLIC-GALLIC ACID								
Fabinyi-Szebehely et al., 1953	10 mice	----	F	0.01 - 0.02 ml. per gm. body wt. daily for 30 d.	P.O.	0	----	30 d.
	10 rabbits	----	----	0.01 - 0.02 ml. per gm. body wt. daily for 30 d.	P.O.	0	----	30 d.
	10 rats	----	----	0.01 - 0.02 ml. per gm. body wt. daily for 30 d.	P.O.	0	----	30 d.
	10 guinea pigs	----	----	0.01 - 0.02 ml. per gm. body wt. daily for 30 d.	P.O.	0	----	30 d.
974. --ERYTHROMYCIN								
Anderson et al., 1952	20 dogs	Mongrel	F	50 -100 mg. per kg. in capsules daily	P.O.	0	100%	3 mos.
	15 rats	----	F	0.05 - 0.2% in the diet for 3 mos.	P.O.	0	2 died	3 mos.
975. --MAGNAMYCIN								
Gardocki et al., 1953	6 cats	----	----	40 - 200 mg. per kg. daily for 9 wks., aqueous suspension	I.M.	0	----	9 wks.
	15 dogs	Mongrel	F	50 - 200 mg. per kg. daily for 8 or more wks., aqueous suspension	I.M.	0	----	Over 20 wks.
	48 rats	Albino	M	20 - 200 mg. per kg. daily for 8 wks.	I.M.	0	40 alive	8 wks.
976. --MAGNAMYCIN HYDROCHLORIDE								
Gardocki et al., 1953	48 rats	Albino	M	20 - 200 mg. per kg. daily	I.M.	0	34 alive	20 wks.
	48 rats	Albino	M	0.5 - 0.40% in the diet	P.O.	0	36 alive	Over 17 wks.
	9 dogs	Mongrel	F	50 - 200 mg. per kg. daily 6 d. per wk.	P.O.[538]	0	----	19 wks.
977. --OIL YELLOW HA[539]								
Kirby and Peacock, 1949	34 mice	Stock	M&F	17 to 20 inj. of 0.25 ml., 3% dye in arachis oil at 3 wk. intervals	S.C.	Tumors[540]	----	600 d.
978. --TANNIC ACID								
Barnes, 1948	Rats	Albino	M&F	20% aqueous, 1 ml.	S.C.	0[541]	Killed at various intervals	70 d.

[538] Stomach pump.
[539] Formula not published.
[540] 1 hepatoma in a female, 1 spindle cell sarcoma in a female at the site of injection.
[541] A histological study of a staining seen in the mucosa of the duodenum.

Reference	Animal	Strain or type	Sex	Preparation and dose	Site and route	Animals with tumors	Survival	Duration of experiment
978.--TANNIC ACID--Continued								
Bope et al., 1948	16 rats	----	----	5 - 10% aqueous spray	Skin[542]	0	----	36 d.
Korpassy and Kovacs, 1949	20 rats	White	M&F	1-2% soln. at various intervals	S.C.	0[542a]	3 alive at 100 d.	141 d.
Korpassy, 1950	20 rats	White	----	1% soln., 100 mg. per kg. 4 times every other day, 200 mg. per kg. 6 times every other day, 200 - 300 mg. per kg. every 4 to 8 d.	S.C.	Tumors[543]	4 alive at 100 d.	At least 100 d.
Korpassy and Mosonyi, 1950b	23 rats	----	----	2% aqueous soln., 150-200 mg. per kg. every 5 d., casein diet	S.C.	Tumors[544]	17 died at 103 d.	At least 274 d.
	29 rats	----	----	2% aqueous soln., 150-200 mg. per kg. every 5 d., diet of waste food from hospital	S.C.	Tumors[545]	19 died at 109-320 d.	At least 320 d.
Korpassy and Mosonyi, 1950a	28 rats	White	M&F	150 - 200 mg. as a 1.5 - 2.0% aqueous soln. every 5 d.	S.C.	13[546]	23 alive at 100 d.	388 d.
	20 rats	White	----	5% aqueous soln. daily	Skin[547]	0	14 alive at 300 d.	505 d.
Korpassy and Mosonyi, 1951a	Rats	----	M&F	150-200 mg. per kg. body wt. in 1.5-2% aqueous soln. for 290 d. (usually every 5th day).	S.C.	Tumors[548]	23 alive at 100 d.	At least 388 d.
	Rats	----	M&F	150 - 200 mg. per kg. body wt. in 1.5-2% aqueous soln. for 290 d. (usually given every 5th d.)	S.C.	Tumors[549]	19 alive at 100 d.	At least 388 d.
	20 rats	----	----	Ulcers were daily painted with 5% fresh aqueous tannic acid soln. (burning treatment repeated at intervals of 6 wks.). 17 rats treated daily with 5% hydrochloric acid.	Skin	0	14 alive at 300 d.	At least 505 505 d.
Korpassy and Mosonyi, 1951b	40 rats	White	M&F	150-250 mg. per kg. body wt. in a 1.5-2.5% aqueous soln., every 5th d. for 180 d. High casein with low fat diet	S.C.	Tumors[550]	25 died by 180 d.	180 d.
	40 rats	White	M&F	150 - 250 mg. per kg. body wt. in a 1.5-2.5% aqueous soln., every 5th d. for 180 d. Low casein with high fat diet	S.C.	Tumors[551]	21 died by 180 d.	180 d.
Perissinotto and Lombardi, 1952a	25 rats	----	----	Aqueous soln. from 1 - 2%, 100 to 200 mg. per kg. body wt. every 5 d.	S.C.	0	----	249 d.
Perissinotto and Lombardi, 1952b	9 rats	Albino	M&F	Aqueous soln. from 1 - 2%, 100 to 200 mg. per kg. body wt. every 5 d.	S.C.	0	----	259 d.
979.--TRIGENTISIC ACID								
Fabinyi-Szebehely et al., 1953	10 mice	----	F	0.01 - 0.02 ml. per gm. body wt. daily for 30 d.	P.O.	0	----	30 d.
	10 rabbits	----	----	0.01 - 0.02 ml. per gm. body wt. daily for 30 d.	P.O.	0	----	30 d.
	10 rats	----	----	0.01 - 0.02 ml. per gm. body wt. daily for 30 d.	P.O.	0	----	30 d.

[542] Burned skin.
[542a] Nodular cirrhosis.
[543] 1 with benign hepatoma, 1 with cholangioma.
[544] 3 with hepatic tumors.
[545] 13 with hepatic tumors.
[546] Hepatomas and cholangiomas.
[547] To areas of ulceration following burning.
[548] In 13 of 23 animals or 56%, hepatomas and cholangiomas.
[549] In 3 of 18 animals, or 16%, hepatomas and cholangiomas.
[550] 11 hepatomas in animals surviving over 100 days.
[551] 25 hepatomas in animals surviving over 100 days.

Reference	Animal	Strain or type	Sex	Preparation and dose	Site and route	Animals with tumors	Survival	Duration of experiment
979. --TRIGENTISIC ACID--Continued								
Fabinyi-Szebehely et al., 1953	10 guinea pigs	----	----	0.01 - 0.02 ml. per gm. body wt. daily for 30 d.	P.O.	0	----	30 d.
980. --TRI-p-HYDROXYBENZOIC ACID								
Fabinyi-Szebehely et al., 1953	10 rabbits	----	----	0.01 - 0.02 ml. per gm. body wt. daily for 30 d.	P.O.	0	----	30 d.
	10 rats	----	----	0.01 - 0.02 ml. per gm. body wt. daily for 30 d.	P.O.	0	----	30 d.
	10 guinea pigs	----	----	0.01 - 0.02 ml. per gm. body wt. daily for 30 d.	P.O.	0	----	30 d.
	10 mice	----	F	0.01 - 0.02 ml. per gm. body wt. daily for 30 d.	P.O.	0	----	30 d.
981. --VIOMYCIN [552]								
P'an et al., 1951	4 cats	----	----	100 or 500 mg. per kg. daily as 10% aqueous soln.	I.M.	0	----	53 d.
	30 rats	----	----	50 - 200 mg. per kg. daily as 10% aqueous soln., for 6 wks.	S.C.	0	----	6 wks.
	6 dogs	----	F	50 or 100 mg. per kg. daily as 10% aqueous soln.	I.M.	0	----	150 d.
982. --VITAMIN B_{12}								
Traina, 1950	12 guinea pigs	----	----	5 μg. daily for 21 d. then 37 d. interval and 15 μg.	S.C. I.P.	0	----	58 d.
Mirone and Wade, 1953	Mice	C3H, CF_1, C57, dba	M&F	50 μg. per d. in the diet	P.O.	0[553]	----	10 wks.

[552] Crystalline sulphate.

[553] No pathology discussed.

BIBLIOGRAPHY

A

Aaes-Jørgensen, E., Dam, H. and Granados, H.: Acta pharmacol. et toxicol. 7: 171-180 (1951).
Aaes-Jørgensen, E. See Granados, H.
Aberg, B. See Friberg, U.
Abrams, E. W. See Corbett, D. G.
Abramson, E.: Acta pharmacol. et toxicol. 9: 337-344 (1953).
Abramson, W. and Warshawsky, H.: J. Urol. 59: 76-82 (1948).
Acevedo, D. and Migone, A.: An. Fac. med. Univ. nac. mayor San Marcos, Lima 35: 261-283 (1952) (Pub. 1953)
Acevedo, D. and Migone, A.: Rev. Cien., Lima 50: 463 (1948).
Adams, E. M., Spencer, H. C., Rowe, V. K., Irish, D. D.: A.M.A. Arch. Indust. Hyg. 1: 225-236 (1950).
Adams, E. M., Spencer, H. C., Rowe, V. K., McCollister, D.D. and Irish, D. D.: A.M.A. Arch. Indust. Hyg. 4: 469-481 (1951).
Adams, E. M., Spencer, H. C., Rowe, V. K., McCollister, D. D. and Irish, D. D.: A.M.A. Arch. Indust. Hyg. 6: 50-66 (1952).
Adams, E. M. See Rowe, V. K.; Spencer, H. C.
Adams, J. L., McGibbon, W. H. and Casida, L. E.: Poultry Science 29: 666-671 (1950).
Aegerter, E. A. See Shay, H.
Afrikanova, E. A. See Andres, A. G.
Aguirre, C. See Romero, E.
Ahmad, N. D. See Aterman, K.
Akman, L. See Stamler, J.
Alfredson, B. V., Stiefel, J. R., Thorp, F., Baten, W. D. and Gray, M. L.: J. Am. Pharm. A. (Scient. Ed.) 40: 263-267 (1951).
Allard, C. See DeLamirande, G.
Allen, E. See Pfeiffer, C. A.
Allen, J. M.: J. Exper. Zoology 123: 289-308 (1953).
Allen, S. C. and DeEds, F.: J. Am. Oil Chemists' Soc. 28: 304-306 (1951).
Allison, J. B., Wase, A. W., Leathem, J. H. and Wainio, W. W.: Cancer Res. 10: 266-271 (1950).
Allison, J. B., Wase, A. W. and Migliarese, J. F.: Cancer Res. 12: 244 (1952).
Allison, J. B. See Leathem, J. H.; Wase, A. W.
Allsopp, C. B.: Brit. J. Cancer 5: 273-279 (1951).
Allsopp, C. B. See Fell, H. B.
Almasy, F.: Verhandl. schweiz. Naturforsch. Gesellsch. 128: 173-175 (1948).
Altschul, R.: Am. Heart J. 36: 480 (1948).
: New England J. Med. 249: 96-99 (1953).
Altschul, R. and Spencer, E. Y.: Rev. canad. biol. 11: 250-258 (1952).
Alvarez, E. See Draize, J. H.
Ambrad-Dominguez, N. and Cardeza, A. F.: Rev. Soc. argent. biol. 28: 129-136 (1952).
Ambrose, A. M.: A.M.A. Arch. Indust. Hyg. 2: 582-590 (1950a).
: A.M.A. Arch. Indust. Hyg. 2: 591-597 (1950b).
: A.M.A. Arch. Indust. Hyg. 3: 48-51 (1951a).
: A.M.A. Arch. Indust. Hyg. 3: 52-56 (1951b).
: J. Am. Pharm. A. (Scient. Ed.) 40: 277-279 (1951c).
Ambrose, A. M., Christensen, H. E. and Rather, L. J.: J. Am. Pharm. A. (Scient. Ed.) 42: 364-366 (1953a).
Ambrose, A. M., Christensen, H. E., Robbins, D. J. and Rather, L. J.: A.M.A. Arch. Indust. Hyg. 7: 197-210 (1953b).
Ambrose, A. M., DeEds, F., Rather, L. J.: J. Indust. Hyg. & Toxicol. 31: 158-161 (1949).
Ambrose, A. M., DeEds, F. and Rather, L. J.: Proc. Soc. Exper. Biol. & Med. 74: 132-134 (1950).
Ambrose, A. M., Robbins, D. J. and DeEds, F.: J. Am. Pharm. A. (Scient. Ed.) 41: 119-122 (1952).
Ambrus, C. M., Ambrus, J. L. and Harrisson, J. W.: Am. J. Pharm. 123: 129-130 (1951).
Ambrus, J. L. See Ambrus, C. M.
Amira, A. See Sala, G.
Anderson, H. H. See Hine, C. H.
Anderson, R. C., Harris, P. N. and Chen, K. K.: J. Am. Pharm. A. (Scient. Ed.) 39: 583-585 (1950).
: J. Am. Pharm. A. 41: 555-559 (1952).
Anderson, W. See Peacock, P. R.
Andervont, H. P.: J. Nat. Cancer Inst. 10: 927-941 (1950a).
: J. Nat. Cancer Inst. 11: 73-81 (1950b).
Andervont, H. P. and Dunn, T. B.: J. Nat. Cancer Inst. 10: 895-917 (1950).
: J. Nat. Cancer Inst. 14: 329-340 (1953).
Andreasen, E. and Engelbreth-Holm, J.: Acta path. et microbiol. scandinav. 32: 165-169 (1953).
Andres, A. G., Portugalov, B. V. and Afrikanova, E. A.: Arkh. Pat. 13: No. 4, 72-77 (1951).
Angelico, R.: Farmaco, (Ed. sc.) 8: 384-397 (1953).
Antalffy, A. See Haranghy, L.
Armstrong, E. C. and Bonser, G. M.: J. Path. & Bact. 60: 517-519 (1948).
: Brit. J. Cancer 4: 203-211 (1950).
Armstrong, M. I. See Gray, A. E.
Arrington, L. R. and Davis, G. K.: J. Nutrition 51: 295-304 (1953).

Asboe-Hansen, C. See Engelbreth-Holm, J.
Ashe, W. F., Largent, E. J., Dutra, F. B., Hubbard, D. M. and Blackstone, M.: A.M.A. Arch. Indust. Hyg. 7: 19-43 (1953).
Ashenburg, N. J. See Stokinger, H. E.
Aterman, K. and Ahmad, N. D.: Lancet 264: 71-73 (1953).
Atkinson, J. See Pryor, J.
Atkinson, W. B., Kaunitz, H., Slanetz, C. A., Johnson, R. E. and Fuhr, A.: Ann. New York Acad. Sc. 52: 68-71 (1949).
Aub, J. C. See Glinos, A. D.
Auerbach, S. H. See Meneely, G. R.
Axelrad, A. and Leblond, C. P.: Proc. Am. A. Cancer Res. 1: 2 (1953).
Axelrod, A. E. and Hofmann, K.: Cancer Res. 13: 442-444 (1953).

B

Bacon, H. E. See Laurens, J.
Bacon, R. L.: Cancer Res. 12: 246 (1952).
Bacon, R. L. See Kirkman, H.
Baglioni, T.: Tumori 38: 267-274 (1952).
Baglioni, T. and Lorenzoni, L.: Tumori 38: 257-266 (1952).
Bagshaw, M. A. and Strong, L.C.: Cancer Res. 9: 603 (1949).
: J. Nat. Cancer Inst. 11: 141-176 (1950).
Baguena, M. B., Candela, J. B., Orts, F. M. and Garra, W. C.: Arch. med. exper. (Madrid) 14: 47-74 (1951).
Baker, B. L. and Whitaker, W. L.: Univ. Hosp. Bull. (Ann Arbor) 15: 4 (1949).
Baker, B. L. See Castor, C. W.
Baker, R. See Deuel, H. J., Jr.
Baker, R. K.: Cancer Res. 13: 137-140 (1953).
Ball, W. L., Kay, K. and Sinclair, J. W.: A.M.A. Arch. Indust. Hyg. 7: 292-300 (1953).
Balli, V.: Riv. anat. pat. e onc. 3: 414-429 (1950).
Balo, J., Juhasz, J. and Varga, G.: Acta morphol. 3: 101-110 (1953).
: Kiserl. Orvostud. 4: 267-271 (1952).
Balter, E. L. See Jones, R. J.
Banks, S. O., Bhaskar, S. N. and Weinmann, J. P.: A.M.A. Arch. Path. 51: 19-29 (1951).
Barberio, J. R. See Le Veen, H. H.
Bardawill, C. J. and Gornall, A. G.: Canad. J. M. Sc. 30: 272-283 (1952).
Barilli, V. See Capraro, V.
Barken, H. B. See Leathem, J. H.
Barkulis, S. See Cloudman, A. M.
Barlow, O. W. and Lewis, J. R.: J. Pharmacol. & Exper. Therap. 103: 147-152 (1951).
Barnes, B. F., Freytag, F. C., Garrison, W. M. and Rosenfeld, I.: Science 108: 82 (1948).
Barnes, J. M.: Brit. J. Exper. Path. 29: 495-500 (1948).
: Proc. 9th Internat. Cong. Indust. Med., London 1948, 630-632 (1949).
: Lancet 258: 463 (1950).
Barnes, J. M. and Denz, F. A.: Brit. J. Indust. Med. 8: 117-126 (1951a).
: J. Hyg. 49: 430-441 (1951b).
: J. Path. & Bact. 65: 597-605 (1953).
Barnes, J. M., Denz, F. A. and Sissons, H. A.: Brit. J. Cancer 4: 212-222 (1950).
Barnes, J. M. See Parker, V. H.
Barnum, C. P. See Kretchmer, N.
Bartlett, M. N. See Humm, J. H.; Kochakian, C. D.
Baserga, R. See Shubik, P.
Bass, S. L. See Rowe, V. K.
Baten, W. D. See Alfredson, B. V.
Bauer, F. C., Hirsch, E. F., Carbonaro, L. and Johnson, G. C.: A.M.A. Arch. Path. 56: 135-141 (1953).
Bauer, R. O. and Lehman, A. J.: J. Am. Pharm. A. (Scient. Ed.) 40: 257-260 (1951).
Bauer, W. H. and Byrne, J. J.: Cancer Res. 10: 755-761 (1950).
Bauer, W. H. See Byrne, J. J.
Baumann, C. A. See Clayton, C. C.; Griffin, A. C.; Miller, W. L.; Rumsfeld, H. W., Jr.; Swick, R. W.
Bavin, E. M. and James, B.: J. Pharm. & Pharmacol. 4: 856-870 (1952).
Baxter, J. H.: Am. J. Path. 24: 503-525 (1948).
: Bull. Johns Hopkins Hosp. 85: 138-167 (1949).
Bazilevich, V. V. See Bergol'ts, V. M.
Beattie, J. and Chambers, R. D.: J. Endocrinol. 10: 65-72 (1953).
Beavers, D. C. See Dertinger, B. L.
Beck, S. See Peacock, P. R.
Becker, D. L. See Mulligan, R. M.
Beeckmans, M. L. See Maisin, J.
Beijers, J. A.: Tijdschr. Diergeneesk. 77: 587-605 (1952).
Bellini, L. See Moretti, G. P.
Benati, O. See Sala, G.
Bendick, A. See Philips, F. S.
Benelli, C., Geyer, A. and Mazer, A.: Compt. rend. Soc. biol. 147: 1616-1618 (1953).
Benison, D. See Cicardo, V. H.
Benko, S., Koltay, M. and Gabor, P.: Kiserl. Orvostud. 3: 270-276 (1951).
Bennett, J. G. See Hare, W. V.; Stewart, H. L.
Bennison, B. E. and Mostofi, F. K.: J. Nat. Cancer Inst. 10: 989-992 (1950).
Benson, W. M., Stefko, P. L. and Roe, M. D.: Am. Rev. Tuberc. 65: 376-391 (1952).

Berenblum, I.: Quoted as unpublished results (1949) in: Carcinogenesis and Tumor Pathogenesis, 1. Berenblum, Advances in Cancer Research 2: 129 (1954).
Berenblum, I. and Shubik, P.: Brit. J. Cancer 3: 109-118 (1949a).
: Brit. J. Cancer 3; 384-386 (1949b).
Berfenstam, R.: Acta paediat. 39: 467-468 (1950a).
: Proc. Sect. Pediat. School Hyg. Swedish Med. Soc., June 3, (1950b).
Berg, A. See Shils, M. E.
Berg, N. O.: Nord. med. 40: 1948-1949 (1948).
Berger, F. M. and Ludwig, B. J. J. Pharm. Exper. Ther. 100: 27-37 (1950).
Bergol'ts, V. M.: Uspekhi. Sovem. Biol. 36: 278-280 (1953).
Bergol'ts, V. M. and Il'ina, A. A.: Biokhimiya 16: 262-268 (1951).
Bergol'ts, V. M., Il'ina, A. A. and Bazilevich, V. V.: Biokhimiya 14: 275-283 (1949).
Bergstrand, C. G.: Acta endocrinol. 4: 91-101 (1950).
Bergstrand, C. G.: Acta endocrinol. 9: Suppl. 8, 7-106 (1952).
Bern, H. A.: Cancer Res. 9: 65-73 (1949).
Bernardini, A. See Ferroni, A.
Bernelli-Zazzera, A.: Tumori 36: 204-214 (1950).
Bertrand, I., Nordmann, J. and Nordmann, R.: Presse méd. 60: 409-412 (1952).
Bertrand, I., and Quivy, D.: Compt. rend. Soc. biol. 144: 368-370 (1950).
: Compt. rend. Soc. biol. 146: 638-640 (1952).
Best, C. H., Hartroff, W. S., Lucas, C.C. and Ridout, J. H.: Brit. M. J. 2: 1001-1006 (1949).
Best, C. H. See Sellers, E. A.
Bevans, M. See Steiner, A.
Beyer, K. H. See McKinney, S. E.
Bhaskar, S. N. See Banks, S. O.
Bichel, J. See Bjerre-Hansen, P.; Hansen, P. B.
Bielschowsky, F.: Brit. J. Cancer 3; 547-549 (1949a).
: Prog. méd. 3: 79-90 (1949b).
: Acta physiol. latinoam. 3: 57-59 (1953).
Bielschowsky, F. and Bielschowsky, M.: Brit. J. Cancer 6: 89-92 (1952).
Bielschowsky, F. and Bullough, W. S.: Brit. J. Cancer 3: 282-285 (1949).
Bielschowsky, F. and Griesbach, W. E.: Brit. J. Cancer 4: 133-138 (1950).
Bielschowsky, F. and Hall, W. H.: Brit. J. Cancer 5: 106-114 (1951a).
: Brit. J. Cancer 5: 331-344 (1951b).
Bielschowsky, F. See Hall, W. H.; Malcolm. J.
Bielschowsky, M. See Bielschowsky, F.
Billingham, R. E., Orr, J. W. and Woodhouse, D. L.: Nature 166: 1080 (1950).
: Brit. J. Cancer 5: 417-432 (1951).
Bishop, C. J. See McGowan, L. J.
Bjerre-Hansen, P. and Bichel, J.: Acta radiol. 37: 258-265 (1952).
Blanchet, H. J., Jr. See Hodge, H. C.
Bleisch, V. R. See Geyer, R. P.
Block, M. H. See Jacobson, L. O.
Blumberg, H., Schlesinger, A. and Gordon, S. M.: J. Pharmacol. & Exper. Therap. 105: 336-342 (1952).
Bochey, J. M. See McKinney, S. E.
Bock, F. G. See Moore, G. E.
Boddaert, J. See Gardner, W. U.
Bogue, J. Y. and Carrington, H. C.: Brit. J. Pharmacol. 8: 230-236 (1953).
Bolene, C. See Robbard, S.; Stamler, J.
Bomze, E. J. See Carleton, R.
Bond, A. M. and Murray, M. M.: J. Physiol. (London) 116: 18 P (1952).
Bonser, G. M., Clayson, D. B. and Jull, J. W.: Lancet 261: 286-288 (1951).
Bonser, G. M., Clayson, D. B., Jull, J. W. and Pyrah, L. N.: Brit. J. Cancer 6: 412-424 (1952).
Brit. J. Cancer 7: 456-459 (1953).
Bonser, G. M. and Green, H. N.: J. Path. & Bact. 62: 531-539 (1950).
Bonser, G. M. and Robson, J. M.: Brit. J. Cancer 4: 196-202 (1950).
Bonser, G. M. See Armstrong, E. C.
Bonte, J.: Bull. Assoc. franç. étude cancer 37: 157-166 (1950).
Booth, J. See George, E. P.
Bope, F. W., Cranston, E. M. and Gisvold, O.: J. Pharmacol. & Exper. Therap. 94: 209-214 (1948).
Borasi, M. See Cavallero, C.; Sala. G.
Boretti, G. See Gallico, E.
Borsos-Nachtnebel, E. See Richardson, H. L.
Boutwell, R. K., Brush, M. K. and Rusch, H. P.: Cancer Res. 9: 741-746 (1949a).
: Cancer Res. 9: 747-752 (1949b).
Boutwell, R. K. and Rusch, H. P.: Proc. Am. A. Cancer Res. 1: 5-6 (1953).
Boyland, E. and Horning E. S.: Brit. J. Cancer 3: 118-123 (1949).
Boyland, E. and Sargent, S.: Brit. J. Cancer 5: 433-440 (1951).
Boynton, L. C. See Woislawski, S.
Bracale, U. See Moracci, E.

Brackney, E. L. See Moore, G. E.
Bradbury, J. T. See Janes, R. G.
Braden, A. W. H. and Peterson, J. E.: Australian J. Exper. Biol. & M. Sc. 6: 520-532 (1953).
Braekkan, O. R. See Njaa, L. R.
Brahmachari, H. D. See Nath, M. C.
Brandt, E. L. See Griffin, A. C.; Ward, D. N.
Breedis, C.: Cancer Res. 10: 205-206 (1950).
: Cancer Res. 11: 239 (1951).
: Cancer Res. 12: 861-866 (1952).
Brewer, N. R. See Carlson, A. J.
Brian, D. B.: Acta Unio Internat. contra cancrum 7: 660-669 (1951).
Brieger, H. and Hodes, W. A.: Proc. 9th Internat. Cong. Indust. Med., London 1948 598-602 (1949).
: A.M.A. Arch. Indust. Hyg. 3: 287-291 (1951).
Brodie, D. C. and Lowenhaupt, E.: J. Am. Pharm. A. (Scient. Ed.) 38: 498-502 (1949).
Brown, B. B., Thompson, C. R., Klahm, G. R. and Werner, H. W.: J. Am. Pharm. A. (Scient. Ed.) 39: 305-311 (1950).
Brown, H. B. See Page, I. H.
Brown, M. See Danowski, T. S.
Brown, M. M. and Young, W. C.: Endocrinology 50: 600-606 (1952).
Brown, R. K. See Miller, E. C.
Brownlee, G., Green, A. F. and Woodbine, M.: Brit. J. Pharmacol. & Chemo. 3: 15-28 (1948).
Brush, M. K. See Boutwell, R. K.
Bruzzone, S.: Brit. J. Cancer 3: 398-400 (1949).
Bruzzone, S., Elgueta, H., Iglesias, R. and Lipschütz, A.: Brit. J. Cancer 2: 267-272 (1948).
Bruzzone, S. and Lipschütz, A.: Compt. rend. Soc. biol. 146: 980-983 (1952).
: Acta endocrinol. 12: 28-36 (1953).
Bryant, E. F. See Small, C. S.
Bryant, J. E. See Geyer, R. P.
Bucciero, M. C. and Orten, J. M.: Am. J. Physiol. 154: 513-516 (1948).
Bucciero, M. C. See Orten, J. M.
Bucher, N. L. R. See Glinos, A. D.
Buckell, M.: Brit. J. Indust. Med. 7: 122-124 (1950).
Buckley, J. J., Buckley, S. M. and Snipes, A. E.: Bull. Johns Hopkins Hosp. 89: 218-233 (1951).
Buckley, S. M. See Buckley, J. J.
Bulliard, H. and Ravina, A.: Compt. rend. Soc. biol. 127; 525-528 (1938).
Bullough, W. S. See Bielschowsky, F.
Bundren, D., Howell, D. E. and Heller, V. G.: Proc. Soc. Exper. Biol. & Med. 79: 236-238 (1952).
Bur, E. See Membrives, J. R.
Bur, G. E. See de Pasqualini, C. D.
Burdette, W. J.: J. Nat. Cancer Inst. 9: 105-110 (1948).
: Cancer Res. 12: 252 (1952).
Burdette, W. L.: Cancer Res. 12: 201-205 (1952).
Burgoyne, F. H. See Symeonidis, A.
Burgoyne, H. L., Heston, W. E., Hartwell, J. L. and Stewart, H. L.: J. Nat. Cancer Inst. 10: 665-672 (1950).
Burke, J. C. See Rubin, B.
Burlington, H. and Lindeman, V. F.: Proc. Soc. Exper. Biol. & Med. 74: 48-51 (1950).
Buschke, W. See Fitzhugh, O. G.
Butenandt, A. and Dannenberg, H.: Arch. Geschwulstforsch. 6: 1-7 (1953).
Butenandt, A. See Kaufmann, C.
Buttle, G. A. H. and Dyer, F. J.: J. Pharm. & Pharmacol. 2: 371-375 (1950).
Buu-Hoï, N. P.: J. Chem. Soc.; 2882-2888 (1948).
Buu-Hoi, N. P. See Chamorro, A.; Lacassagne, A.; Rudali, G.; Zajdela, F.
Byham, B. B. See McKinney, S. R.
Byrne, J. J. and Bauer, W. H.: J. Dent. Res. 29: 672 (1950).
Byrne, J. J. See Bauer, W. H.

C

Cajaho, A.: Folia med. 34: 8-26 (1951)
Calbert, C. E. See Deuel, H. J., Jr.
Caleff, I. M.: Boll. Soc. ital. biol. sper. 24: 935-936 (1948).
Caltabiano, S., Vallerini, G. and Fabbrini, A. Rass. fisiopat. clin. 25: 831-847 (1953).
Calvin, L. D. See Cook, D. L.; Freese, H. B.
Cambel, P.: Quarterly J. Florida Acad. Science 15: 53-62 (1952).
Cambel, P. and Ray, F. E.: Cancer Res. 11: 242 (1951).
: Cancer Res. 12: 252-253 (1952).
Cambel, P. See Ray, F. E.
Cameron, G. R. and Cheng, K. K.: Brit. M. J. 11: 819-821 (1951).
Campbell, T. W. See Schinz, H. R.
Candee, C. F. See Reinhard, M. C.
Candela, J. B. See Baguena, M. B.
Cannon, W. M. See Walton, R. P.
Cantarow, A., Stasney, J. and Paschkis, K. E.: Cancer Res. 8: 412-417 (1948).
Cantarow, A. See D'Angelo, S. A.; Paschkis, K. E.; Stasney, J.
Cantero, A.: Acta Unio internat. contra cancrum 6: 687-695 (1949).
Cantero, A.: Acta Unio internat. contra cancrum 7: 74-78 (1950).

Cantero, A., Daoust, R. and deLamirande, G.: Science 112: 221 (1950).
Cantero, A. See deLamirande, G.
Caplan, P. S. See Margolis, H. M.
Capraro, V. and Barilli, V.: Farmaco (Pavia) 5: 160-164 (1950).
Carbonaro, L. See Bauer, F. C.
Cardeza, A. F.: Rev. Soc. argent. biol. 26: 150-159 (1950).
Cardeza, A. F. See Chiodi, H.; Ambrad-Dominguez, N.
Carleton, R., Friedman, N. B. and Bomze, E. J.: Cancer Res. 12: 253 (1952).
Carlson, A. J. and Brewer, N. R.: Proc. Soc. Exper. Biol. & Med 84: 684-688 (1953).
Carlson, A. J. See Eagle, E.
Carminati, V. and Chirico, M.: Tumori 37: 83-92 (1951a).
: Tumori 37: 198-207 (1951b).
Carpenter, C. P., Critchfield, F. H., Nair, J. H., and Schaffer, C. B.: A.M.A. Arch. Indust. Hyg. 4: 261-269 (1951).
Carpenter, C. P., Pozzani, U. C. and Weil, C. S.: A.M.A. Arch. Indust. Hyg. 8: 377-381 (1953).
Carpenter, C. P., Weil, C. S., Pozzani, U. C. and Smyth, H. F., Jr.: A.M.A. Arch. Indust. Hyg. 2: 420-432 (1950).
Carpenter, C., (P.) Weil, C. S. and Smyth, H. F.: A.M.A. Arch. Indust. Hyg. 8: 219-226 (1953).
Carpenter, C. P. See Pozzani, U. C.; Smyth, H. F., Jr.
Carr, C. J. See Tawab, S. A. A.
Carratala, R.: Rev. asoc. méd. argent. 65: 282-284 (1951).
Carrington, H. C. See Bogue, J. Y.
Cartaya, J. A. See Kaufman, N.
Cartwright, G. E. See Palmer, J. G.
Casarotto, G.: Clin. odontoiat. 7: 113-115 (1952).
Casas, C. B. and Koppisch, E.: Endocrinology 51: 322-328 (1952).
Casas, C. B. See King, J. T.
Casida, L. E. See Adams, J. L.
Caskey, W. H., Moore, D. J., Tillotson, I. G. and Hayman, J. M.: Proc. Soc. Exper. Biol. & Med. 77: 105-107 (1951).
Castillo, J. C., DeBeer, E. J. and Jaros, S. N.: J. Pharmacol. & Exper. Therap. 96: 388-395 (1949).
Castor, C. W. and Baker, B. L.: Endocrinology 47: 234-241 (1950).
Catolla-Cavalcanti, A.: Minerva med. 41: 11, 927-931 (1950).
Cavallero, C., Rossi, L. and Borasi, M.: Sperimentale 101: 226-235 (1951).
Cavallero, C. See Sala, G.
Cazzoroli, L. See Villani, G.
Cepero, E. B. See Ibañez, J. S.
Ceresa, C and De Blasiis, M.: Med. lavoro 41: 1-8 (1950).
Ceresa, C. and Grazioli, C.: Med. lavoro 42: 253-257 (1951).
: Med. lavoro 43: 124-128 (1952).
Chabrier, T., Giudicelli, R., and Thuillier, J.: Ann. pharm. franç. 8: 261-273 (1950).
Chaifoff, I. L. See Siperstein, M. D.
Chambers, R. D. See Beattie, J.
Chamorro, A.: Compt. rend. Soc. biol. 142: 426-428 (1948).
Chamorro, A., Buu-Hoi, N. P. and Dat-Xuong, N.: Compt. rend. Soc. biol. 147: 558-559 (1953).
Chapman, D. See Handley, C. A.
Chen, K. K. See Anderson, R. C.; Robbins, E. B.
Cheng, K. K. See Cameron, G. R.
Cheymol, J., Gay, Y. and Lavedan, J. P. Ann. pharm. franç. 9: 59-68 (1951).
Child, G. P. and Crump, M.: Acta pharmacol. et toxicol. 8: 305-314 (1952).
Child, G. P., Paquin, H. O., Jr. and Deichmann, W. B.: A.M.A. Arch. Indust. Hyg. 3: 479-482 (1951).
Chiodi, H. and Cardeza, A. F.: A.M.A. Arch. Path. 48: 395-404 (1949).
Chirico, G. See Larizza, P.
Chirico, M. See Carminati, V.
Christensen, H. E. See Ambrose, A. M.
Chu, E. See Forbes, M.
Circardo, V. H. and Benison, D.: Rev. Soc. argent. biol. 28: 174-179 (1952).
Ciceri, C. See Sala, G.
Clark, M. C. See Cunningham, R. W.; Harned, B. K.
Claus, P. E. See Guyer, M.
Clausen, H. J.: Proc. Soc Exper. Biol. & Med 83: 835-837 (1953).
Clayson, D. B. See Bonser, G. M.
Clayton, C. C. and Baumann, C. A.: Cancer Res. 9: 575-582 (1949a).
: Cancer Res. 9: 623 (1949b).
Clayton, C. C. See Griffin, A. C.; Rumsfeld, H. W., Jr.
Clement, G., Clement, J. and LeBreton, E.: Compt. rend. Acad. sc. 237: 97-99 (1953).
Clement, G., Clement, J., LeBreton, E., Pascaud, M. and Tubiana, M.: J. physiol. 45: 76-78 (1953).
Clement, J. See Clement, G.
Cleveland, F. P. See Treon, J. F.
Cloudman, A. M., Vining, D., Barkulis, S. and Nickson, J. J.: Am. J. Path. 25: 810 (1949).
Clowes, G. H. A. See Harris, P. N.
Clymer, R. H., Jr. See Hughes, B.
Code, C. F. See Welbourn, R. B.
Cohen, P. P. See Sorof, S.; Tung, T. C.
Cole, V. V. See Hopper, S. S.
Collip, J. B. See Noble, R. L.
Combescot, C. and Riviere, M.: Compt. rend. Soc. biol. 147: 1358-1360 (1953).

Comfort, A. See Weatherall, M.
Congdon, C. C. See Mulay, A. S.
Connant, C. See Mulines, M. G.
Cook, D. L., Ray, R., Davisson, E., Feldstein, L. M., Calvin, L. C. and Green, D. M.: J. Exper. Med. 96: 27-34 (1952).
Cook, H. See Griffin, A. C.
Cook, J. W. and Schoental, R.: Brit. J. Cancer 3: 557-558 (1949).
: Brit. J. Cancer 6: 400-406 (1952).
Cooke, A. See Ivy, A. C.
Coon, J. M. See DuBois, K. P.; Rider, J. A.
Cooper, B. J. See Gruhzit, O. M.
Cooper, Z. K. See Eckert, C. T.
Copeland, D. H. and Engel, R. W.: Cancer Res. 10: 211 (1950).
Copeland, D. H. See Engel, R. W.; Salmon, W. D.
Corbett, D. G. and Abrams, E. W.: J. Urol. 64: 377-391 (1950).
Corner, J. A. See Wilson, J. W.
Corre, L., Mariani, P. L. and Reverdin, R.: Bull. Assoc. franç. étude cancer 38: 144-161 (1951).
Corre, L. See Lacassagne, A.
Correale, P.: Boll. Soc. ital. biol. sper. 29: 1594-1596 (1953).
Correll, J. W. See Kellner, A.
Corsiglia, V. F. See Griffin, A. C.
Cosgrove, R. R. See Cunningham, R. W.
Costa, E. See Ferrari, W.
Couch, J. R. See Elam, J. F.
Cowen, P. N.: Brit. J. Cancer 3: 94-97 (1949).
: Brit. J. Cancer 4: 245-253 (1950a).
: Brit. J. Cancer 4: 337-340 (1950b).
Crabtree, H. G.: Brit. J. Cancer 2: 281-289 (1948).
: Brit. J. Cancer 3: 387-398 (1949).
Craig, J. M. and Maddock, C. E.: A.M.A. Arch. Path. 55: 118-130 (1953).
Crampton, J. M. and Voss, E: J. Am. Pharm. A. (Scient. Ed.) 41: 135-138 (1952).
Cranston, E. M. See Bope, F. W.
Crepax, P.: Arch. sc. biol. 34: 406-436 (1950).
: Arch sc. biol. 37: 442-453 (1953).
Critchfield, F. H. See Carpenter, C. P.
Crossley, M. L. See Sugiura, K.
Crump, M. See Child, G. P.
Cruz, W. O., da Silva, F. M. and de Mello, R. P.: Rev. brasil. biol. 8: 231-245 (1948).
Cullen, M. See P'an, S. Y.
Cunningham, L., Griffin, A. C. and Luck, J. M.: Cancer Res. 10: 194-199 (1950).
Cunningham, L. See Griffin, A. C.
Cunningham, R. W., Harned, B. K., Clark, M.C., Cosgrove, R. R., Daugherty, N. S., Hine, C. H., Vessey, R. E. and Yuda, N. N.: J. Pharmacol. & Exper. Therap. 96: 151-165 (1949).
Cunningham, R. W., Hines, L. R., Stokey, E. H., Vessey, R. E. and Yuda, N. N.: Antibiotics Ann. 1953-54, Proc. Symposium Antibiotics (Washington D.C.) 63-69 (1953).
Cunningham, R. W. See Harned, B. K.
Curd, F. H. S., Davey, D. G., Hendry, J. A. and Rose, F. L.: Brit. J. Pharmacol. 5: 438-444 (1950).
Curran, R. C.: J. Path. & Bact. 66: 271-282 (1953).
Curtis, M. R. See Dunning, W. F.

D

DaCruz, A. and Pereira, F. B.: Compt. rend. Soc. biol. 144: 1573-1575 (1950).
Dale, A. C. See Wolfee, J. B.
Dallemagne, M. J., Derivaux, J., Liegeois, F. and Melon, J.: Bull Soc. chim. biol. 32: 250-254 (1950a).
Dallemagne, M. J., Gerebtzoff, M. A. and Philippot, E.: Compt. rend. Soc. biol. 144: 457 (1950b).
: Science 112: 148 (1950c).
Dallemagne, M. J. See Gerebtzoff, M. A.
Dalton, A. J., Morris, H. P. and Dubnik, C. S.: J. Nat. Cancer Inst. 9: 201-223 (1948).
Dalton, A. J., Morris, H. P., Striebich, M. J. and Dubnik, C. S.: J. Nat. Cancer Inst. 11: 391-397 (1950).
Dalton, A. J. See Dubnik, C. S.; Morris, H. P.
Dam, H. See Aaes-Jørgensen, E.; Granados, H.
Danchakov, V.: Compt. rend. Acad. Sc. 227: 1276-1277 (1948).
Danchakov, V. and Nicod. J. L.: Compt. rend. Acad. sc. 228: 1282 (1949).
D'Angelo, S. A., Paschkis, K. E., Cantarow, A., Siegel, A. N. and Rivero-Fontan, J. L.: Endocrinology 49: 624-634 (1951).
Danneberg, P. See Druckrey, H.
Dannenberg, H. See Butenandt, A.
Danowski, T. S., Wirth, P., Brown, M., Hill, G. C. and Fetterman, G. H.: J. Clin. Endocrinol. 12: 1454-1460 (1952).
Daoust, R. See Cantero, A.
Darby, W. J. See Meneely, G. R.
da Silva, F. M. See Cruz, W. O.
Dat-Xuong, N. See Chamorro, A.
Dauber, D., Horlick, L. and Katz, L. N.: Am. Heart J. 38: 25-33 (1949).
Daugherty, N. S. See Cunningham, R. W.
Daum, K. See Osborn, M.

Davey, D. G. See Curd, F. H. S.
Davibhadhana, B.: Cancer Res. 12: 165-169 (1952).
Davidow, B. and Frawley, J. P.: Proc. Soc. Exper. Biol. & Med. 76: 780-783 (1951).
Davidow, B. See Radomski, J. L.
Davidson, J. D. See Steiner, A.
Davies, T. A. L. and Harding, H. E.: Brit. J. Indust. Med. 7: 70-72 (1950).
Davis, C. C. See Keith, J. F., Jr.
Davis, G. K. See Arrington, L. R.
Davis, W. E., Jr. See Griffin, A. C.
Davisson, E. See Cook, D. L.
Day, H. G. See Muhler, J. C.
Day, P. L., Payne, L. D. and Dinning, J. S.: Proc. Soc. Exper. Biol. & Med. 74: 854-855 (1950).
Day, P. L. See Dinning, J. S.
Dearborn, E. H. See Marshall, E. K., Jr.
DeBeer, E. J. See Castillo, J. C.
DeBias, D. A.: Am. J. Physiol. 165: 476-480 (1951).
Debie, F. See van der Schueren, G.
DeBlasiis, M. See Ceresa, C.
DeDominicis, G.: Rass. clin., terap. e sc. affini 48: 189-194 (1949).
DeEds, F. See Allen, S. C.; Ambrose, A. M.; Wilson, R. H.
deGraaf, H. J.: Arch. internat. pharmacodyn. 87: 159-163 (1951).
Deichmann, W. B., Witherup, S., Kitzmiller, K. V. and Heyroth, F. F.: "The Toxicity of DDT" Kettering Lab., College of Med., U. of Cincinnati, 1950, 233 pp.
Deichmann, W. B. See Child, G. P.; Treon, J. F.
deJongh, D. K. and van Proosdij-Hartzema, E. G.: J. Pharmacol. & Exper. Therap. 105: 130-138 (1952).
deLamirande, G., Allard, G. and Cantero, A.: Cancer 6: 179-183 (1953).
deLamirande, G. See Cantero, A.
Delfel, N.E. and Griffin, A. C.: Stanford M. Bull. 11: 65-58 (1953).
Delker, L. L. See Mountain, J. T.
Delost, P. See Hung, L.
DeMajo, S. See Lewis, R. A.
DeMeio, R. H. and Jetter, W. W.: J. Indust. Hyg. & Toxicol. 30: 53-57 (1948).
deMello, R. P. See Cruz, W. O.
Deming, Q. B. See Greenspan, F. S.
DeMuro, P. and Rowinski, P.: Acta med. scandinav. 141: 70-76 (1951).
Denton, R. W., Sheldon, P. and Ivy, A. C.: Cancer Res. 10: 684-685 (1950).
Denz, F. A. See Barnes, J. M.; Parker, V. H.
DeOliveira, J. R. See Howes, E. L.
De Ome, K. B., Julian, L. and Strait, L. A.: Rev. Path. comparée 49: 550-551 (1949).
dePasqualini, C. D. and Bur, G. E.: Rev. Soc. argent. biol. 25: 215-221 (1949).
dePasqualine, C. E. D. See Membrives, J. R.
Deringer, M. K.: J. Nat. Cancer Inst. 12: 437-445 (1951).
Deringer, M. K., Dunn, T. B. and Heston, W. E.: Proc Soc. Exper. Biol. & Med. 83: 474-479 (1953).
Deringer, M. K. and Heston, W. E.: J. Nat. Cancer Inst. 14: 127-130 (1953).
Deringer, M. K. See Heston, W. E.
Derivaux, J. See Dallemagne, M. J.
Dernehl, C. U., Nau, C. A., Frank, T. M., Neidhardt, H. W.: J. Indust. Hyg. & Toxicol. 31: No. 1, 32-40 (1949).
Dertinger, B. L., Beaver, D. C. and Lands, A. M.: Proc. Soc. Exper. Biol. & Med. 68: 501-505 (1948).
de Seze, L. See Oberling.
Desforges, G., Desforges, J. and Robbins, S. L.: Cancer 3: 1088-1096 (1950).
Desforges, J. See Desforges, G.
Deuel, H. J., Jr., Greenberg, S. M., Calbert, C. E., Baker, R. and Fisher, H. R.: Food Res. 16: 258-280 (1951).
Deuel, H. J. See Marx, W.
deVenanzi, F.: Acta cien. venezolana 1: 123-125 (1950).
deVinals, R. R.: Bull. Assoc. franç. étude cancer 36: 305-310 (1949).
deVinals, R. R.: Acta Unio internat. contra cancrum 7: 149-151 (1950).
Devoldre, J. See Stokinger, H. E.
Dick, E. C. See Johansson, K. R.
Dickison, H. L. See Hoekstra, J. B.
Dietz, A. A. and Steinberg, B.: Arch Biochem. 26: 291-298 (1950).
Dinning, J. S., Keith, C. K., Parsons, J. T. and Day, P. L.: J. Nutrition 42: 81-88 (1950).
Dinning, J. S. See Day, P. L.
Dmochowski, L. and Orr, J. W.: Brit. J. Cancer 3: 376-384 (1949).
Dobriner, K. See Spitz, S.
Dobrovolskaia, N. and Rudali, G.: Compt. rend. Soc. biol. 144: 782-783 (1950).
Domenjoz, R. See Wilhelmi, G.
Dominguez, C. M. See Muñiz, J. Z.
Donahue, D. D. See von Oettingen, W. F.
Doniach, I.: Brit. J. Cancer 4: 223-224 (1950).
: Brit. J. Cancer 7: 181-202 (1953).
Doniach, I. and Logothetopoulos, J.: Brit. J. Exper. Path. 34: 146-151 (1953).
Donskov, V. A. See Grushko, Y. M.
Doud, T. See Hoyt, H. S.

Doull, J. See DuBois, K. P.
Dowdy, A. H. See Haley, T. J.
Downs, W. See Hodge, H. C.
Draize, J. H., Alvarez, E., Whitesell, M. F., Woodward, G., Hagan, E. C. and Nelson, A. A.: J. Pharmacol. & Exper. Therap. 93: 26-39 (1948).
Drebinger, J.: Die Medizinische 7: 795-797 (1952).
Dreyfuss, M. L. See Finnegan, J. K.; Haag, H. B.; Smith, R. B., Jr.
Drill, V. A. and Hiratzka, T.: A.M.A. Arch. Indust. Hyg. 7: 61-78 (1953).
Druckrey, H.: Arch. exper. Path. u Pharmakol. 210: 137-158 (1950a).
: Arch. klin. Chir. 264: 45-55 (1950b).
: Arzneimittel-Forsch. 1: 383-394 (1951).
Druckrey, H. and Hamperl, H.: Klin. Wchnschr. 28: 289 (1950).
Druckrey, H. and Schmahl, D.: Ztschr. Naturforschung. 7b: 353-356 (1952).
: Naturwissenschaften 41: No. 22 (1954a).
: Ztschr. Naturforschung. 9b: 529 (1954b).
Druckrey, H., Schmahl, D. and Reiter, A.: Arzneimittel-Forsch. 4: 365 (1954).
Dubnik, C. S., Morris, H. P. and Dalton, A. J.: J. Nat. Cancer Inst. 10: 815-841 (1949).
Dubnik, C. S. See Dalton, A. J.; Morris, H. P.
DuBois, K. P., Doull, J. and Coon, J. M.: J. Pharmacol. & Exper. Therap. 99: 376-393 (1950).
DuBois, K. P. See Herrmann, R. C.
Dudley, H. C., Henry, K. E. and Lindsley, B. F.: J. Pharmacol. & Exper. Therap. 98: 409-417 (1950).
Dudley, H. C. and Levine, M. D.: J. Pharmacol. & Exper. Therap. 95: 487-493 (1949).
Dudley, H. C. and Marrer, H. H.: J. Pharmacol. & Exper. Therap. 106: 129-134 (1952).
Duescher, H. O. See Richards, R. K.
Duff, G. L. See Payne, T. P.
Dufrenoy, J. See Funwel, J.
Duguid, J. B. See Rannie, I.
Dunihue, F. W. See Robertson, W. V. B.
Dunlap, M. K. See Hine, E. H.
Dunn, T. B. See Andervont, H. P.; Deringer, M. K.; Morris, H. P.
Dunning, W. F. and Curtis, M. R.: Cancer Res. 12: 702-706 (1952).
Dunning, W. F., Curtis, M. R. and Friedgood, C. E.: Cancer Res. 8: 83-89 (1948a).
: Cancer Res. 9: 546 (1949a).
Dunning, W. F., Curtis, M. R. and Madsen, M. E.: Acta Unio internat. contra cancrum 7: 238-245 (1951).
Dunning, W. F., Curtis, M. R. and Maun, M. E.: Cancer Res. 9: 354-361 (1949b).
: Cancer Res. 9: 608 (1949c).
: Cancer Res. 10: 213-214 (1950a).
: Cancer Res. 10: 319-323 (1950b).
: Cancer Res. 10: 454-459 (1950c).
Dunning, W. F., Curtis, M. R. and Segaloff, A.: Cancer Res. 7: 511-521 (1947).
: Acta Unio internat. contra cancrum 6: 109-123 (1948b).
: Cancer Res. 13: 147-152 (1953).
Duran-Reynals, F.: Ann. New York Acad. Sc. 54: 977-991 (1952).
Dutra, F. B. See Ashe, W. F.
Dutra, F. M. See Treon, J. F.
Dutra, F. R.: A.M.A. Arch. Indust. Hyg. 3: 81-89 (1951).
Dutra, F. R. and Largent, E. J.: Am. J. Path. 26: 197-209 (1950).
Dutra, F. R., Largent, E. J. and Roth, J. L.: A.M.A. Arch. Path. 51: 473-479 (1951).
Dutra, F. R. See Treon, J. F.
duVigneaud, V. See Maw, G. A.
Dyad'kova, A. M.: Arkh. Pat. 11: No. 4, 23-6 (1949).
Dyer, F. J. See Buttle, G. A. H.
Dyer, H. M.: J. Nat. Cancer Inst. 11: 1073-1080 (1951).

E

Eagle, E. and Carlson, A. J.: J. Pharmacol. & Exper. Therap. 99: 450-457 (1950).
Eagle, H. See Germuth, F. G.
Eckert, C. T., Cooper, Z. K. and Seelig, M. G.: A.M.A. Arch. Path. 19: 83-90 (1935).
Edel, V. See Mouriquand, G.
Edgecomb, J. H. See Steiner, P. E.
Edwards, L. D. See Zupko, A. G.
Effkemann, G. See Herold, L.
Eichwald, E. J. See Palmer, J. G.
Eisenberg, E. See Gordan, G. S.
Ekert, B. See Rudali, G.
Ekman, B. and Strömbeck, J. P.: Acta path. et microbiol. scandinav. 26: 447-466 (1949a).
: Acta path. et microbiol. scandinav. 26: 472-479 (1949b).
Ekman, B. See Strömbeck, J. P.
Ekwall, P. and Setälä, K.: Acta path. et microbiol. scandinav. 26: 795-803 (1949).
Ekwall, P. See Saxén, E.; Setälä, K.
Elam, J. F., Gee, L. L. and Couch, J. R.: Proc. Soc. Exper. Biol. & Med. 77: 209-213 (1951).

Eldredge, N. T. and Luck, J. M.: Cancer Res. 12: 801-806 (1952).
Elgueta, H. See Bruzzone, S.
Ellinwood, L. E. See Rider, J. A.
Ellis, N. R. See Stevenson, J. W.
Elsner, R. W. See Kensler, C. J.
Elson, L. A.: Brit. J. Cancer 6: 392-399 (1952).
Elwi, A. M.: J. Roy. Egyptian M. A. 33: 773-781 (1950).
Ely, J. O. and Ross, M. H.: J. Franklin Inst. 250: 377-378 (1950).
Engel, P.: An. Soc. biol. Bogota 3: 65-67 (1948a).
Engel, P.: Wien. Klin. Wchnschr. 60: 321-326 (1948b).
: An. Soc. biol. Bogota 4: 27-34 (1950).
Engel, R. W.: Cancer Res. 10: 215 (1950).
: Cancer Res. 11: 246-247 (1951).
: Cancer Res. 12: 260 (1952).
Engel, R. W. and Copeland, D. H.: Science 108: 336-337 (1948).
: Cancer Res. 9: 566 (1949a).
: Cancer Res. 9: 608 (1949b).
: Cancer Res. 11: 180-183 (1951).
: Cancer Res. 12: 211-215 (1952a).
: Cancer Res. 905-908 (1952b).
Engel, R. W. See Copeland, D. H.
Engelbreth-Holm, J. and Asboe-Hansen, C.: Acta path. et microbiol. scandinav. 32: 560-564 (1953).
Engelbreth-Holm, J. and Iversen, S.: Cancer Res. 7: 372-378 (1947).
: Acta path. et microbiol. scandinav. 29: 77-88 (1951).
Engelbreth-Holm, J. and Jensen, E.: Acta path. et microbiol. scandinav. 33: 257-262 (1953).
Engelbreth-Holm, J. and Roholt, K. Acta pharmacol. et toxicol. 9: 117- (1953).
Engelbreth-Holm, J. See Andreasen, E.; Iversen, S.
Ercoli, N., Schachter, R. J., Hueper, W. C. and Lewis, M. N.: J. Pharmacol. & Exper. Therap. 93: 210-222 (1948).
Ershoff, B. H.: Proc. Soc. Exper. Biol. & Med. 78: 836-840 (1951).
Eschenbrenner, A. B. See Highman, B.
Eser, G.: Istanbul Univ. Tip Fak. mecmua. 15: (1952).
Ettala, T. See Roine, P.
Evans, H. M. See Moon, H. D.
Everett, G. M. and Richards, R. K.: J. Pharmacol. & Exper. Therap. 106: 303-313 (1952).
Eyestone, W. H. See Morris, H. P.
Ezeyza, S.: Semana med. 100: 663-666 (1952a).
: Semana med. 100: 778-780 (1952b).
: Semana med. 100: 780-782 (1952c).

F

Fabbrini, A. See Caltabiano, S.
Fabinyi-Szebehely, M., Hahn, L. and Szebehely, J.: Brit. J. Pharmacol. 8: 30-33 (1953).
Fabre, R., Truhaut, R. and Perón, M.: Arch. mal. profess. 13: 437-448 (1952).
Falk, H. L. See Steiner, P. E.
Fanelli, G. M. See Gardocki, J. F.
Fazekas, I. G.: Endokrinologie 30: 45-54 (1953).
Feldstein, L. M. See Cook, D. L.
Fell, H. B. and Allsopp, C. B.: Cancer Res. 8: 177-182 (1948).
Fellows, E. J., Macko, E. and Fendrick, A. J.: J. Pharmacol. & Exper. Therap. 100: 72-77 (1950a).
Fellows, E. J., Macko, E. and McLean, R. A.: J. Pharmacol. & Exper. Therap. 100: 267-272 (1950b).
Fels, E.: Bol. Soc. Broteriana 22: 119-143 (1948).
: Compt. rend. Soc. biol. 144: 1226 (1950a).
: Rev. Soc. argent. biol. 26: 38-43 (1950b).
Fendrick, A. J. See Fellows, E. J.
Ferguson, F. C., Jr.: J. Pharmacol. & Exper. Therap. 106: 261-270 (1952).
Ferguson, J. H. See Prior, J. T.
Ferguson, J. K. See Sellers, E. A.
Ferguson, J. K. W. and Sellers, E. A.: J. Pharmacol. & Exper. Therap. 97: 177-181 (1949).
Ferrari, W. and Costa, E.: Tumori 36: 293-303 (1950).
Ferret, P.: J. méd. Bordeaux 128: 436 (1951).
Ferroni, A. and Bernardini, A.: Boll. soc. ital. biol. sper. 29: 1531-1533 (1953).
Fetterman, G. H. See Danowski, T. S.; Margolis, H. M.
Figge, F. H. J.: Cancer Res. 12: 261 (1952).
Figge, F. H., Wolfe, G. F. and Figge, R. Y.: Cancer Res. 9: 630 (1949).
Figge, R. Y. See Figge, F. H.
Fimiani, R.: Folia med. (Naples) 34: 260-263 (1951).
: Folia med. (Naples) 35: 94-101 (1952).
Finerty, J. C. See Rennels, E. G.
Finger, G. C. See Miller, J. A.
Finley, I. See Hine, C. H.
Finnegan, J. K., Haag, H. B., Larson, P. S. and Dreyfuss, M. L.: J. Pharmacol. & Exper. Therap. 92: 269-276 (1948).
Finnegan, J. L. See Haag, H. B.; Smith, R. B., Jr.
Firminger, H. I. and Mulay, A. S.: J. Nat. Cancer Inst. 13: 19-33 (1952).
Firminger, H. I. and Stewart, H. L.: Am. J. Path. 25: 815 (1949).
: J. Nat. Cancer Inst. 12: 491-531 (1951).

Firminger, H. I. See Morris, H. P.; Mulay, A. S.
Fisher, H. R. See Deuel, H. J., Jr.
Fishberg, A. M., Friedfeld, L., Hoffman, I., Stoller, E. R. and Fishberg, E. H.: Proc. Soc. Exper. Biol. & Med. 75: 301-303 (1950).
Fishberg, E. H. See Fishberg, A. M.
Fisken, R. A. See Gruhzit, O. M.; Weston, J. K.
Fitzgerald, P. J. See Money, W. L.
Fitzhugh, O. G. and Buschke, W.: A.M.A. Arch. of Ophth. 41: 572-582 (1949).
Fitzhugh, O. G. and Nelson, A. A.: Science 108: 626-628 (1948a).
: J. Am. Pharm. A. (Scient. Ed.) 37: 29-32 (1948b).
Fitzhugh, O. G., Nelson, A. A. and Frawley, J. P.: J. Pharmacol. & Exper. Therap. 100: 59-66 (1950a).
Fitzhugh, O. G., Nelson, A. A. and Frawley, J. P.: J. Am. Pharm. A. (Scient. Ed.) 40: 583-586 (1951).
Fitzhugh, O. G., Nelson, A. A. and Holland, O. L.: Fed. Proc. 7: 218-219 (1948a).
: J. Pharmacol. & Exper. Therap. 93: 147-152 (1948b).
Fitzhugh, O. G., Nelson, A. A., Laug, E. P. and Kunze, F. M.: A.M.A. Arch. Indust. Hyg. 2: 433-442 (1950b).
Fitzhugh, O. G. See Frawley, J. P.; Laug, E. P.; Nelson, A. A.
Flaks, J.: Brit. J. Cancer 2: 386-394 (1948).
Fleming, H. S.: J. Dent. Res. 31: 398-411 (1952).
: J. Dent. Res. 32: 469-485 (1953).
Flemming, A. J. See Gehrmann, G. H.
Foley, E. J.: Cancer Res. 13: 835-837 (1953).
Follis, R. H., Jr.: Proc. Soc. Exper. Biol. & Med. 78: 723-724 (1951).
Follis, R. H., Jr. See Handler, P.
Fones, W. S. and White, J.: J. Nat. Cancer Inst. 12: 423-426 (1951).
Forbes, M., Shockman, G. D., Chu, E. and Gyergy, P.: Antibiotics & Chemother. 3: 1104-1110 (1953).
Forni, P. V. and Tappi, G.: Boll. Soc. ital. pat. 1: 12-15 (1950).
Foulger, J. H. See Gehrmann, G. H.
Francis, J., Spinks, A. and Stewart, G. T.: Brit. J. Pharmacol. 5: 549-564 (1950).
Franckson, J. R. M.: Compt. rend. Soc. biol. 144: 1720-1721 (1950).
Frank, L. See Sulzberger, M. B.
Frank, P. See Hall, R. H.
Frank, T. M. See Dernehl, C. U.
Franke, W. See Kopf, R.
Frankel, S. See Roberts, E.
Franks, W. R. and Meek, G. A.: Rev. canad. biol. 11: 61-62 (1952).
Frantz, J. C., Jr. See Tawab, S. A. A.
Frantz, M. J. and Kirschbaum, A.: Proc. Soc. Exper. Biol. & Med. 72: 282-283 (1949).
Fraser, F. C.: Canad. J. Res. 27 (Section D): 179-185 (1949).
Fraser, M. S. See Tuba, J.
Frawley, J. P., Hagan, E. C. and Fitzhugh, O. G.: J. Pharmacol. & Exper. Therap. 105: 156-165 (1952).
Frawley, J. P. See Davidow, B.; Fitzhugh, O. G.
Freed, S. C., Friedman, M. and Rosenman, R. H.: Proc Soc. Exper. Biol. & Med. 77: 732-733 (1951).
Freese, H. B., Hambourger, W. E., Calvin, L. D. and Green, D. M.: J. Pharmacol. & Exper. Therap. 104: 54-59 (1952).
Freytag, F. C. See Barnes, B. F.
Friberg, U., Graf, W. and Aberg, B.: Acta pharmacol. et toxicol. 220-234 (1953).
Friedewald, W. F. and Rous, P.: J. Exper. Med. 91: 459-483 (1950).
Friedfeld, L. See Fishberg, E. H.
Friedgood, C. E. See Dunning, W. F.
Friedman, M. See Freed, S. C.
Friedman, N. B. See Carleton, R.
Friedrich-Freksa, H. See Kaufmann, C.
Frisk, A. R.: Nord. med. 43: 1-6 (1950).
Fritze, E. See Tischendorf, W.
Fritz-Niggli, H. See Schinz, H. R.
Fromherz, K.: Arch. internat. pharmacodyn. 85: 387-398 (1951).
Fulton, G. P. See Lutz, B. R.
Funagoshi, H.: Hukuoka acta med. 43: 375-385 (1952).
Funwel, J. and Dufrenoy, J.: Congr. internat. path. Comparada (Madrid) 6: 117-123 (1952).
Fuortes, C. See Patellani, E.
Furlong, E., Krichesky, B. and Glass, S. J.: Endocrinology 45: 1-9 (1949).
Furrer, W. See Ruedi, L.
Fuyat, H. N. See Radomski, J. L.

G

Gabor, P. See Benko, S.
Gallico, E.: Tumori 34: 213-217 (1948).
Gallico, E. and Boretti, G.: Tumori 34: 131-138 (1948).
Gandarias, M. See Romero, E.
Gangitano, L.: Boll. Soc. ital. biol. sper. 24: 57-59 (1948).
Garcia-Valdecasas, F., Kapff, J. and Salva, J. A.: Arch. inst. farm. exper. (Med.) (Madrid) 3: 82-87 (1951).
Gardner, D. E. See Stokinger, H. E.

Gardner, W. U. and Boddaert, J.: A.M.A. Arch. Path. 50: 750-764 (1950).
Gardner, W. U. See Li, M. H.; Pan, S. C.
Gardocki, J. F., P'an, S. Y., Rapuzzi, A. L., Fanelli, G. M. and Timmens, E. K.: Antibiotics & Chemother. 3: 55-62 (1953).
Garra, W. C. See Baguena, M. B.
Garrison, W. M. See Barnes, B. F.
Gaston, E. See Jacobson, L. O.
Gauchery, O. See Nordmann, J.
Gay, Y. See Cheymol, J.
Gee, L. L. See Elam, J. F.
Geever, E. F. See Princi, F.
Gehrmann, G. H., Foulger, J. H. and Fleming, A. J.: Proc. 9th internat. Cong. Indust. Med. 473 (1949).
Gel'shtein, V. I.: Arkh. Pat. 15: No. 5, 58-66 (1953).
Genara Guzman, P.: Rev. Fac. form. y bioquim., Univ. nac. Mayor San Marcos 10: 215-235 (1948).
George, E. P., George, M., Booth, J. and Horning, E. S.: Nature 164: 1044-1045 (1949).
George, M. See George, E. P.
Gerebtzoff, M. A., Dallemagne, M. J. and Philippot, E.: Compt. rend. Soc. biol. 144: 1135-1147 (1950).
Gerebtzoff, M. A. See Dallemagne, M. J.
Germuth, F. G. and Eagle, H.: J. Pharmacol. & Exper. Therap. 92: 397-410 (1948).
Gewin, H. M. See Klatskin, G.
Geyer, A. See Benelli, C.
Geyer, R. P., Bleisch, V. R., Bryant, J. E., Robbins, A. N., Saslaw, I. M. and Stare, F. J.: Cancer Res. 11: 474-478 (1951).
Geyer, R. P., Bryant, J. E., Bleisch, V. R., Peirce, E. M. and Stare, F. J.: Cancer Res. 13: 503-506 (1953).
Ghadially, F. N. See Whiteley, H. J.
Ghiringheilli, C., Parola, P. L. and Zanaboni, A.: Atti Soc. lombarda sc. med. biol. 8: 295-299 (1953).
Ghosh, A. See Kar, A. B.
Giangrasso, G.: Zacchia 9: 174-224 (1946).
Gibson, R. D. See Wenzel, D. G.
Gifford, H. See Greenspan, F. S.
Gilbert, C. See Gillman, J.
Gillman, J., Gilbert, C., Gillman, T. and Spence, I.: South Africa M. J. 22: 783-784 (1948).
Gillman, J., Gillman, T., and Gilbert, C.: South African J. M. Sc. 14: 21-84 (1949).
Gillman, J. and Gillman, T.: Clin. Proc. 8: 222-361 (1949). : Cancer 5: 792-846 (1952).
Gillman, T.: S. African J. M. Sc. 16: 94 (1951).
Gillman, T. See Gillman, J.
Gisvold, O. See Bope, F. W.
Giudicelli, R. See Chabrier, T.
Glass, S. J. See Furlong, E.
Glazer, L. See Shay, H.
Glickman, I. and Pruzansky, S.: Oral Surg. 3: 235 (1950).
Glinos, A. D. and Bucher, N.L.R.: Acta Unio internat. contra cancrum 6: 713-719 (1949).
Glinos, A. D., Bucher, N. L. R. and Aub, J. C.: J. Exper. Med. 93: 313-325 (1951).
Globus, J. H.: J. Neuropath. & Exper. Neurol. 7: 418-431 (1948).
Glover, R. E. and Jennings, A. R.: J. Path. & Bact. 65: 185-191 (1953).
Gluckman, E. C. See Gross, L.
Goddard, R. F.: Anatomical Record 101: 539-575 (1948).
Godwin, J. T. See Money, W. L.
Gofman, J. W. See Pierce, F. T.
Golbert, Z. W.: Arkh. Pat. 10: No. 2, 31-40 (1948).
Goldberg, A. A., Shapero, M. and Wilder, E.: J. Pharm. & Pharmacol. 2: 89-97 (1950).
Goldblatt, H. See György, P.
Goldeck, H. and Hagenah, H.: Ztschr. ges. exper. Med. 117: 467-480 (1951).
Goldman, J.: A.M.A. Arch. Path. 49: 169-172 (1950).
Goldwater, L. J. See Shils, M. E.
Goodall, K. See Hoch-Ligeti, C.
Goodman, S. N. See Taylor, E. S.
Gopalkrishna, A. See Nath, M. C.
Gorbman, A.: Cancer Res. 7: 746-758 (1947).
Gordan, G. S., Eisenberg, E., Moon, H. D. and Sakamoto, W.: J. Clin. Endocrinol. 11: 209-212 (1951).
Gordon, R. B. See Jones, R. J.
Gordon, S. M. See Blumberg, H.
Gorlin, R. See Levy, B. M.
Gormsen, H. See Rask-Nielsen, R.
Gornall, A. G. See Bardawill, C. J.
Gosselin, R. See Jasmin, G.
Gothie, S. See Moricard, R.
Gottsegen, R. See Levy, B. M.
Gough, N. and Shoppee, C. W.: Biochem. J. 54: 630-632 (1952).
Grad, B. and Leblond, C. P.: Endocrinology 45: 250-266 (1949).
Graeff, I., Kornofsky, D. A., Jager, V. B., Krichesky, B. and Smith, H. W.: Am. J. Path. 24: 1-47 (1948).
Graf, W. See Friberg, U.
Graffi, A.: Arch. Geschwulstforsch. 3: 217-221 (1951).
Graffi, A. and Gummel, H.: Deutsche Gesundheitsw. 7: 1250-1254 (1952).
Graffi, A. and Puhr, L.: Arch. Geschwulstforsch. 2: 1-41 (1950).

Graffi, A., Ulsperger, E. and Hoffmann, F.: Arch. Geschwulstforsch. 3: 212-216 (1951).
Granados, H., Aaes-Jørgensen, E. and Dam. H.: Experientia 6: 150-152 (1950).
Granados, H. See Aaes-Jørgensen
Grattarola, R.: Sperimentale 101: 71-77 (1951).
Gray, A. E., Armstrong, M. I. and Ham, A. W.: Cancer Res. 10: 221 (1950).
Gray, M. G.: A.M.A. Arch. Indust. Hyg. 2: 407-419 (1950).
Grazioli, C. See Ceresa, C.
Green, A. F. See Brownlee, G.
Green, C. D. See Morris, H. P.
Green, D. M. See Cook, D. L.; Freese, H. B.
Green, H. D. See Keith, J. F., Jr.
Green, H. N. See Bonser, G. M.
Greenberg, L. A. and Lester, D.: A.M.A. Arch. Indust. Hyg. 2: 345-347 (1950).
Greenberg, L. A. See Lester, D.
Greenberg, L. D. and Rinehart, J. F.: Proc. Soc. Exper. Biol. & Med. 76: 580-583 (1951).
Greenberg, S. M. See Deuel, H. J., Jr.
Greenblatt, R. B. See Kupperman, H. S.
Greenspan, F. S., Gifford, H. and Deming, Q. B.: Endocrinology 52: 638-645 (1953).
Greep, R. O. See Knobil, E.
Grier, R. S. See Hoagland, M. B.
Griesbach, W. E. See Bielschowsky, F.; Malcolm, J.
Griffin, A. C. and Baumann, C. A.: Cancer Res. 8: 135-138 (1948a).
: Cancer Res. 8: 279-284 (1948b).
Griffin, A. C., Brandt, E. L. and Setter, V.: Cancer Res. 11: 868-872 (1951b).
Griffin, A. C., Brandt, E. L. and Tatum, E. L.: J. A.M.A. 144: 571 (1950).
: Cancer Res. 11: 253 (1951a).
Griffin, A. C., Clayton, C. C. and Baumann, C. A.: Cancer Res. 9: 82-87 (1949a).
Griffin, A. C., Cook, H. and Cunningham, L.: Arch. Biochem. 24: 190-198 (1949b).
Griffin, A. C., Cunningham, L., Brandt, E. L. and Kupke, D. W.: Cancer 4: 410-415 (1951c).
Griffin, A. C., Davis, W. E., Jr. and Tifft, M. O.: Cancer Res. 12: 707-712 (1952).
Griffin, A. C. and Rhein, A.: Acta Unio internat. contra cancrum 7: 363-367 (1951).
Griffin, A. C., Rinfret, A. P. and Corsiglia, V. F.: Cancer Res. 13: 77-79 (1953a).
Griffin, A. C., Rinfret, A. P., Robertson, C. and O'Neal, M.: Proc. Am. A. Cancer Res. 1: 21-22 (1953b).
Griffin, A. C. See Cunningham, L.; Delfel, N. E.; Richardson, H. L.; Robertson, C. H.; Salzberg, D. A.; Ward, D. N.
Gros, G. See Robbard, S.
Grosjean, W. A. See Howard, R. R.
Gross, L., Gluckman, E. C., Kershaw, B. B. and Posselt, A. E.: Cancer 6: 1241-1243 (1953).
Gross, M. L. See Rakoff, A. E.
Gruenstein, M. See Shay, H.
Gruhzit, O. M., Fiske, R. A. and Cooper, B. J.: J. Pharmacol. & Exper. Therap. 92: 103-107 (1948).
Grushko, Y. M., Donskov, V. A. and Kolesnik, V. S.: Gigiena i Sanit. 9: 22-26 (1951).
Guerin, M. See Oberling, C.; Roussy, G.
Gummel, H. See Graffi, A.
Guthneck, B. T. See Schweigert, B. S.
Guyer, M. and Claus, P. E.: Cancer Res. 7: 342-345 (1947).
Guzzardella, C. See Patellani, E.
Gwynn, R. H. and Salaman, M. H.: Brit. J. Cancer 7: 482-489 (1953).
Gwynn, R. H. See Salaman, M. H.
Gyergy, P. See Forbes, M.
Gyergyai, F. See Haranghy, L.
György, P., Rose, C. S. and Goldblatt, H.: Proc. Soc. Exper. Biol. & Med. 67: 67-70 (1948).

H

Haag, H. B., Finnegan, J. K., Larson, P. S., Dreyfuss, M. L., Main, R. J. and Riese, W.: Indust. Med. 17: 477-484 (1948).
Haag, H. B., Finnegan, J. K., Larson, P. S., Riese, W. and Dreyfuss, M. L.: Arch. internat. Pharmacodyn. 83: 491-504 (1950).
Haag, H. B. See Finnegan, J. K.; Smith, R. B., Jr.
Hackmann, C.: Ztschr. Krebsforsch. 57: 530-541 (1951a).
: Ztschr. Krebsforsch. 58: 56-64 (1951b).
Haddow, A., Harris, R. J. C., Kon, G. A. R., and Roe, E. M. F.: Phil. Trans. Roy. Soc. London, s.B, 241: 147-195 (1948).
Haerem, A. T.: Proc. Soc. Exper. Biol. & Med. 68: 330-332 (1948).
Hagan, E. C. and Radomski, J. L.: J. Am. Pharm. A. (Scient. Ed.) 42: 379-382 (1953).
Hagan, E. C. See Draize, J. H.: Frawley, J. P.
Hagenah, H. See Goldeck, H.
Hahn, L. See Fabinyi-Szebehely, M.
Haley, T. J., Mann, S. and Dowdy, A. H.: Science 114: 153-154 (1951).

Haley, T. J. and Stolarsky, F.: Stanford M. Bull. 9: 96-100 (1951).
Hall, C. E., Hall, O. and Pinkston, L. A.: Proc. Soc. Exper. Biol. & Med. 75: 446-449 (1950).
Hall, O. See Hall, C. E.
Hall, R. H., Laskin, S., Frank, P., Maynard, E. A. and Hodge, H. C.: A.M.A. Arch. Indust. Hyg. 4: 458-464 (1951).
Hall, R. H., Scott, J. K., Laskin, S., Stroud, C. A. and Stokinger, H. E.: A.M.A. Arch. Indust. Hyg. 2: 25-48 (1950).
Hall, R. H. See Stokinger, H. E.
Hall, W. H.: Brit. J. Cancer 2: 273-280 (1948).
Hall, W. H. and Bielschowsky, F.: Brit. J. Cancer 3: 534-541 (1949).
Hall, W. H. See Bielschowsky, F.; Malcolm, J.
Halley, T. V. See P'an, S. Y.
Ham, A. W. See Gray, A. E.
Hambourger, W. E. See Freese, H. B.
Hamburger, C.: Acta endocrinol. 9: 99-107 (1952).
Hamilton, J. B. See Montagna, W.
Hammerschmidt, E. and Korting, G.: Ztschr. Haut- u. Geschlechtskrankh. 9: 411-414 (1950).
Hammond, J., Jr.: J. Endocrinol. 7: 172-176 (1951).
Hamperl, H. See Druckrey, H.
Handler, A. H. See Lutz, B. R.
Handler, P. and Follis, R. H., Jr.: J. Nutrition 35: 669-686 (1948).
Handley, C. A., Chapman, D. and Moyer, J. H.: Proc. Soc. Exper. Biol. & Med. 78: 433-437 (1951).
Handley, C. A., Moyer, J. H. and Thomas, J. R.: J. Pharmacol. & Exper. Therap. 108: 424-427 (1953).
Hannig, E.: Arzneimittel-Forsch. 3: 310-313 (1953).
Hansen, P. B. and Bichel, J.: Acta radiol. 37: 258-265 (1952).
Hanson, B. See Schmid, R.
Haranghy, L., Gyergyai, F. and Antalffy, A.: Acad. Sci. Hung. 3: 11-32 (1953).
Hardin, J. O. See Hove, E. L.
Harding, H. E. See Davies, T. A. L.
Hare, W. V., Stewart, H. L., Bennett, J. G. and Lorenz, E.: J. Nat. Cancer Inst. 12: 1019-1055 (1952).
Hare, W. V. See Stewart, H. L.
Harman, J. W. See Price, J. M.
Harned, B. K., Cunningham, R. W., Clark, M. C., Hine, C. H., Kane, M. M., Smith, F. H., Jr., Vessey, R. E., Yuda, N. N. and Zabransky, F. W.: J. Pharmacol. & Exper. Therap. 107: 403-423 (1953).
Harned, B. K. See Cunningham, R. W.
Harris, C. See Shay, H.
Harris, M. R. See von Oettingen, W. F.
Harris, P. N.: Cancer Res. 7: 88-94 (1947).
: Cancer Res. 9: 602 (1949).
Harris, P. N. and Clowes, G. H. A.: Cancer Res. 9: 565 (1949).
: Cancer Res. 12: 471-479 (1952).
Harris, P. N. See Anderson, R. C.
Harris, R. See Stamler, J.
Harris, R. J. C. See Haddow, A.
Harris, R. S., Sherman, H. and Jetter, W. W.: Arch. Biochem. 34: 249-258 (1951a).
: Arch. Biochem. 34: 259-265 (1951b).
Harrison, J. W. E., Trabin, B. and Martin, E. W.: J. Pharmacol. & Exper. Med. 101-102: 179-183 (1951).
Harrison, J. W. See Ambrus, C. M.
Harsh, R., Overholser, M. D. and Wells, L. J.: J. Endocrinol. 1: 261-267 (1939).
Hartmann, G. D.: Bull. Assoc. franç. étude cancer 34: 188-192 (1947).
Hartmann, W. D.: Der Krebsarzt 2: 496-501 (1947).
Hartroff, W. S. See Best, C. H.
Hartwell, J. L. See Burgoyne, H. L.
Haruno, K. See Kishi, S.
Hashimoto, E.: Folia pharmacol. Japon. 48: No. 2, 112-113 (1952).
Hass, G. M. See Kelly, F. B.
Hassert, G. L., Jr. See Rubin, B.
Hauser, E. See Mulines, M. G.
Hawking, F. and Ross, W. F.: Brit. J. Pharmacol. 3: 167-173 (1948).
Hay, A. S. See Sandin, R. B.
Hayes, M. A.: Endocrinology 52: 646-651 (1953).
Hayman, J. M. See Caskey, W. H.
Hazard, J. See Justin-Besancon, L.
Hazleton, L. W.: J. Am. Pharm. A. 38: 433-437 (1949).
Hazleton, L. W. and Holland, E. G.: A.M.A. Arch. Indust. Hyg. 8: 399-405 (1953).
Hazleton, L. W., Tusing, T. W., and Holland, E. G.: J. Pharmacol. & Exper. Therap. 109: 387-392 (1953).
Hecht, G.: Arch. exper. Path. u. Pharmakol. 215: 610-618 (1952).
Hegsted, D. M. See Kaufman, N.
Hein, R. R. See White, J.
Heinbecker, P. See O'Neal, L. W.
Heller, V. G. See Bundren, D.
Hendrick, C., Klug, H. L. and Olson, O. E.: J. Nutrition 51: 131-137 (1953).
Hendry, J. A., Homer, R. F., Rose, F. L. and Walpole, A. L.: Brit. J. Pharmacol. 6: 201-234 (1951a).

: Brit. J. Pharmacol. 6: 235-255 (1951b).
: Brit. J. Pharmacol. 6: 357-410 (1951c).
Hendry, J. A. See Curd, F. H. S.; Rose, F. L.
Hendry, K. E. See Dudley, H. C.
Heppel, L. A., Highman, B. and Peake, E. G.: J. Indust. Hyg. & Toxicol. 30: 189-191 (1948).
Herman, F. See Sulzberger, M. B.
Herold, L. and Effkemann, G.: Zentralbl. gynäk. 61: 1161-1164 (1937).
Herrmann, R. C. and DuBois, K. P.: J. Pharmacol. & Exper. Therap 95: 262-271 (1948).
Herz, A. and Stampfl, B.: Ztschr. ges. exper. Med. 118: 76-90 (1951).
Hess, M. See Rennels, E. G.
Heston, W. E.: J. Nat. Cancer Inst. 10: 125-130 (1949).
: Cancer Res. 10: 224 (1950a).
: J. Nat. Cancer Inst. 11: 415-423 (1950b).
: J. Nat. Cancer Inst. 14: 131-140 (1953).
Heston, W. E. and Deringer, M. K.: Cancer Res. 9: 603 (1949a).
: J. Nat. Cancer Inst. 10: 119-124 (1949b).
: J. Nat. Cancer Inst. 13: 705-718 (1952).
Heston, W. E., Deringer, M. K. and Levillian, W. D.: Proc. Soc. Exper. Biol. & Med. 82: 731-734 (1953a).
Heston, W. E. and Levillain, W. D.: Proc. Soc. Exper. Biol. & Med. 82: 457-460 (1953).
Heston, W. E. and Lorenz, E.: Proc. Am. A. Cancer Res. 1: 24-25 (1953).
Heston, W. E., Lorenz, E. and Deringer, M. K.: Cancer Res. 13: 573-577 (1953b).
Heston, W. E. and Schneiderman, M. A.: Science 117: 109-111 (1953).
Heston, W. E. See Burgoyne, H. L.; Deringer, M. K.
Heyroth, F. F. See Deichmann, W. B.; Treon, J. F.
Hickey, R. C., Iwen, G. W. and Womack, N. A.: Cancer Res. 11: 255-256 (1951).
Hidalgo, J. and Whitehead, R. W.: J. Pharmacol. 103: 347 (1951).
Hieger, I.: Brit. J. Cancer 3: 123-139 (1949).
Higgins, C. C. See McClure, J. A.
Higgins, G. M. See Houssay, A. B.
Highman, B. and Eschenbrenner, A. B.: Cancer Res. 11: 256 (1951).
Highman, B. See Heppel, L. A.
Hildebrand, E. See Lauber, H. J.
Hilfinger, M. F. See Westerfeld, W. W.
Hill, G. C. See Danowski, T. S.
Hill, H.: Tierarztl. Umschau 4: 377-379 (1949).
Hill, J. M. See Sellers, E. A.
Hill, W. T., Stanger, D. W., Pizzo, A., Riegel, B., Shubik, P. and Wartman, W. B.: Cancer Res. 11: 892-897 (1951).
Hill, W. T. See Riegel, B.
Hine, C. H., Anderson, H. H., Finley, I. and Moore, J. G.: J. Am. Pharm. A. (Scient. Ed.) 42: 489-495 (1953a).
Hine, C. H., Anderson, H. H., Moon, H. D., Dunlap, M. K. and Morse, A.: A.M.A. Arch. Indust. Hyg. 7: 282-291 (1953b).
Hine, C. H. See Cunningham, R. W.; Harned, B. K.
Hines, L. R. See Cunningham, R. W.
Hirata, T. See Setsuda, T.
Hiratzka, T. See Drill, V. A.
Hirsch, E. F. See Bauer, F. C.
Hitchcock, C. R.: J. Nat. Cancer Inst. 12: 369-397 (1951a).
: J. Nat. Cancer Inst. 12: 723-733 (1951b).
Hjelt, I. See Kraus, S. D.
Hlinka, J. See Mellors, R. C.
Hoagland, M. B., Grier, R. S. and Hood, M. B.: Cancer Res. 10: 629-635 (1950).
Hoan, N. See Lacassagne, A.
Hoch, H. See Hoch-Ligeti, C.
Hoch-Ligeti, C.: Brit. J. Cancer 3: 285-288 (1949a).
: Brit. J. Cancer 3: 562-568 (1949b).
Hoch-Ligeti, C., Hoch, H. and Goodall, K.: Brit. J. Cancer 3: 140-147 (1949).
Hoch-Ligeti, C. and Russell, D. S.: Acta Unio internat. contra cancrum 7: 126-129 (1950).
Hodes, W. A. See Brieger, H.
Hodge, H. C. and Maynard, E. A.: National Nuclear Energy Service, Div. VI, Vol. I, Book 3: 2321-2328 (1953).
Hodge, H. C., Maynard, E. A., Blanchet, H. J., Jr. and Hyatt, R. E.: A.M.A. Arch. Indust. Hyg. 8: 289-295 (1953).
Hodge, H. C. Maynard, E. A., Downs, W., Blanchet, H. J., Jr. and Jones, C. K.: J. Am. Pharm. A. (Scient. Ed.) 41: 662-665 (1952a).
Hodge, H. C., Maynard, E. A., Thomas, J. F., Blanchet, H. J., Jr., Wilt, W. G., Jr. and Mason, K. E.: J. Pharmacol. & Exper. Therap. 99: 140-148 (1950a).
Hodge, H. C., Maynard, E. A., Wilt, W. G., Jr., Blanchet, H. J., Jr. and Hyatt, R. E.: J. Pharmacol. & Exper. Therap. 99: 112-117 (1950b).
Hodge, H. C., Maynard, E. A. and Blanchet, H. J., Jr.: J. Pharmacol. & Exper. Therap. 104: 60-66 (1952b).
Hodge, H. C., Maynard, E. A., Blanchet, H. J., Jr., Spencer, H. C. and Rowe, V. K.: J. Pharmacol. & Exper. Therap. 104: 202-210 (1952c).
Hodge, H. C., Sterner, J. H., Maynard, E. A. and Thomas, J.: J. Indust. Hyg. & Toxicol. 31: 79-92 (1949).

Hodge, H. C. See Hall, R. H.; Woislawski, S.
Hoekstra, J. B., Tisch, D. E., Rakieten, N. and Dickison, H. L.: J. Am. Pharm. A. (Scient. Ed.) 42: 587-593 (1953).
Hoff, H. E. See Wener, J.
Hoffman, H. E. and Schectman, A. M.: Cancer Res. 12: 129-133 (1952).
Hoffman, I. See Fishberg, A. M.
Hoffman, F. See Graffi, A.
Hoffmann, R. See Schmidt, L. H.
Hofmann, F. G. See Knobil, E.
Hofmann, K. See Axebrod, A. E.
Holland, E. G. See Hazleton, L. W.
Holland, O. L. See Fitzhugh, O. G.
Hollander, W. F. and Strong, L. C.: Cancer Res. 11: 257 (1951).
Hollingsworth, R. L. See Rowe, V. K.
Homer, R. F. See Hendry, J. A.
Hood, M. B. See Hoagland, M. B.
Hoppe, J. O. and Lands, A. M.: J. Pharmacol. & Exper. Therap. 97: 371-378 (1949).
Hoppe, J. O. See Minatoya, H.
Hopper, S. S., Hulpieu, H. R. and Cole, V. V.: J. Am. Pharm. A. (Scient. Ed.) 38: 428-432 (1949).
Horlick, L. and Katz, L. N.: Am. Heart J. 38: 336-349 (1949).
Horlick, L. See Dauber, D.
Horning, E. S.: Lancet ii: 207-209 (1947).
: Brit. J. Cancer 3: 211-230 (1949).
: Brit. J. Cancer 4: 235-244 (1950).
: Brit. J. Cancer 6: 80-88 (1952).
Horning, E. S.: See Boyland, E.; George, E. P.
Houssay, A. B. and Higgins, G. M.: Proc. Staff Meet. Mayo Clin. 24: 597-604 (1949).
Hove, A. E. L.: J. Nutrition 51: 609-622 (1953).
Hove, E. L. and Hardin, J. O.: J. Pharmacol. & Exper. Therap. 106: 88-93 (1952).
Howard, R. R. and Grosjean, W. A.: Surgery 25: 300-303 (1949).
Howell, D. E. See Bundren, D.
Howes, E. L. and DeOliveira, J. R.: Cancer Res. 8: 419-427 (1948).
: Lyon chir. 46: 41-52 (1951).
Hoyt, H. S., Doud, T. and Hoyt, R. S.: Proc. Soc. Exper. Biol. & Med. 76; 748 (1950).
Hoyt, R. S. See Hoyt, H. S.
Hubbard, D. M. See Ashe, W. F.
Hueck, O.: Naunyn-Schmiedebergs Arch. exper. Path. u. Pharmakol. 212: 302-310 (1951).
Hueper, W. C.: Cancer Res. 11: 257-258 (1951).
: Indust. Med. 21: 71-74 (1952a).
: Texas Rep. Biol. & Med. 10: 167-186 (1952b).
Hueper, W. C. See Ercoli, N.
Huffman, S. See Jones, R. J.
Hughes, A. B. See Tauber, O. E.
Hughes, B.: J. Urol. 62: 833-836 (1949).
Hughes, B. and Clymer, R. H., Jr.: J. Urol. 62: 837-841 (1949).
Hughes, H. B. See Schmidt, L. H.
Hulpieu, H. R. See Hopper, S. S.
Humm, J. H., Kochakian, C. D. and Bartlett, M. N.: Am. J. Physiol. 155: 251-254 (1948).
Humm, J. H. See Kochakian, C. D.
Hung, L. and Delost, P.: Compt. rend. Soc. biol. 146: 665-667 (1952).
Hunt, A. D., Jr. See Preston, E.
Hurst, E. W.: J. Path. & Bact. 64: 785-790 (1952).
Huseby, R. A.: Proc. Am. A. Cancer Res. 1: 25 (1953).
Husing, E. and Loeser, A.: Klin. Wochschr. 27: 394-399 (1949).
Hüter, F.: Ztschr. Krebsforsch. 56: 329-334 (1949).
Hyatt, R. E. See Hodge, H. C.
Hyman, A. S. See Wolfee, J. B.

I

Ibañez, J. S. and Cepero, E. B.: Trabajos Inst. Cajal. Invest. Biol. 40: 229-247 (1948).
Ichihara, F. See Ogina, S.
Iglesias, R. See Mardones, E.
Iglesias, R., Mardones, E. and Lipschütz, A. Brit. J. Cancer 7: 221-230 (1953).
Iglesias, R. See Bruzzone, S.
Ignesti, G. See Tinacci, F.
Iidaka, K. See Y. Miyamoto
Il'ina, A. A. See Bergol'ts, V. M.
Ingle, L.: A.M.A. Arch. of Indust. Hyg. 6: 357-367 (1952).
Irish, D. D. See Adams, E. M.; Rowe, V. K.; Spencer, H. C.
Iversen, M., Muck, J. and Schourup, K.: Acta pharmacol. et toxicol. 9: 215-219 (1953).
Iversen, S., Engelbreth-Holm, J. and Noring, O.: Acta path. et microbiol. scandinav. 32: 218-230 (1953).
Iversen, S. See Engelbreth-Holm, J.
Ivy, A. C. and Cooke, A.: J. Nat. Cancer Inst. 7: 345-348 (1947).
Ivy, A. C. See Denton, R. W.; Willheim, R.
Iwen, G. W. See Hickey, R. C.

J

Jaameri, A.: Ann. endocrinol. 8: 48-53 (1947).
Jacobson, L. O., Marks, E. K., Gaston, E. and Block, M. H.: J. Lab. & Clin. Med. 34: 902-924 (1949).

Jacquemain, R., Jullien, A. and Noel, R.: Compt. rend. Acad. sc. 225: 441-443 (1947).
Jaffé, W. G.: Cancer Res. 7: 107-111 (1947a).
: Cancer Res. 7: 113-116 (1947b).
: Cancer Res. 7: 117-119 (1947c).
: Cancer Res. 7: 529-530 (1947d).
: Experimentia 4: 234-236 (1948).
Jager, V. B. See Graeff, I.
Jakobsen, A. H. I.: Acta path. et microbiol. scandinav. 31: 61-66 (1952).
James, B. See Bavin, E. M.
Janes, R. G. and Bradbury, J. T.: Proc. Soc. Exper. Biol. & Med. 79: 187-188 (1952).
Jaros, S. H. See Castillo, J. C.
Jasmin, G. and Gosselin, R.: Rev. Canad. biol. 12: 446-449 (1953).
Jennings, A. R. See Glover, R. E.
Jensen, E. See Engelbreth-Holm, J.
Jeske, I. See Tuba, J.
Jetter, W. W. DeMeio, R. H.; Harris, R. S.
Johansson, K. R., Peterson, G. E. and Dick, E. C.: J. Nutrition 49: 135-152 (1953).
Johnson, G. C. See Bauer, F. C.
Johnson, H. D. and Voss, E.: J. Am. Pharm. A. (Scient. Ed.) 41: 468-472 (1952).
Johnson, J. M. See Morris, H. P.
Johnson, R. E. See Atkinson, W. B.
Jones, C. K. See Hodge, H. C.
Jones, J. H., Rogers, C. S. and Stone, C. H., III: J. Nutrition 39: 579-590 (1949).
Jones, R. J., Kraft, S. C., Huffman, S., Balter, E. L. and Gordon, R. B.: Circulation Res. 1: 530-533 (1953).
Jones, R. N. See Sandin, R. B.
Jones, R. S. See Meechan, R. J.
Juhasz, J. See Balo, J.
Juhn, M.: J. Endocrinol. 9: 155-159 (1953).
Julian, L. See DeOme, K. B.
Jull, J. W.: Brit. J. Cancer 5: 328-330 (1951).
Jull, J. W. See Bonser, G. M.
Jullien, A. See Jacquemain, R.
Jung, F. See Miller, R.
Jung, M. L. See Ray, F. E.
Junkmann, K. See Langecker, H.
Justin-Besancon, L., Rubens-Duval, A., Villiaumey, J. and Hazard, J.: Compt. rend. Soc. biol. 147: 647-649 (1953).

K

Kabak, Y. M. and Pavlova, E. B.: Doklady Akad. nauk. S.S.S.R. 67: 945-948 (1949).
Kaiser, K.: Ztschr. Krebsforsch. 59: 488-495 (1953).
Kamada, H. See Setsuda, T.
Kamen, M. D. See Lansing, A. I.
Kane, M. M. See Harned, B. K.
Kapff, J. See Garcia-Valdecasas, F.
Kar, A. B.: Endocrinology 45: 346-348 (1949).
Kar, A. B. and Ghosh, A.: Indian J. Physiol. & Allied Sc. 4: 25-32 (1950).
Karnofsky, D. A. See Graeff, I.
Kassenaar, A. A. H. See Van Bekkum, D. W.
Katz, L. N. See Dauber, D.; Horlick, L.; Pick, R.; Robbard, S.; Stamler, J.
Kaufman, N. Cartaya, J. A., White, P. L., Hegsted, D. M. and Kinney, T. D.: J. Nutrition 46: 433-444 (1952).
Kaufmann, C., Müller, H. A., Butenandt, A. and Friedrich-Freksa, H.: Ztschr. Krebsforsch. 56: 482-542 (1949).
Kaunitz, H. See Atkinson, W. B.
Kawai, K., Taki, I., Uemura, F., Sayama, Y. and Kitamura, H.: Gann 43: 119-120 (1952).
Kawai, K. See Taki, I.
Kawamura, M.: Folia Pharmacol. Japon. 49: 382-389 (1953).
Kay, K. See Ball, W. L.
Keenan, C. See Treon, J. F.
Keith, C. K. See Dinning, J. S.
Keith, J. F., Jr., Green, H. D., Williams, S. C. and Davis, C. C.: Circulation 6: 902-910 (1952).
Kellner, A., Correll, J. W. and Ladd, A. T.: J. Exper. Med. 93: 385-398 (1951).
Kellner, B. and Matko, L.: Acta morphol., Hung. 3: 125-148 (1953).
Kellner, B. See Sugar, J.
Kelly, F. B., Taylor, B. C. and Hass, G. M.: A.M.A. Arch. Path. 53: 419-436 (1952).
Kendall, F. E. See Steiner, A.
Kensler, C. J. and Elsner, R. W.: J. Pharmacol. & Exper. Therap. 97: 349-357 (1949).
Kensler, C. J., Langemann, H. and Shapiro, E.: Proc. Am. A. Cancer Res. 1: 29-30 (1953).
Kensler, C. See Sugiura, K.
Kenyon, P. See Montagna, W.
Kershaw, B. B. See Gross, L.
Kessel, M., Kortge, P. and Pezold, F. A.: Naunyn-Schmiedebergs Arch. exper. Path. u. Pharmakol. 221: 123-134 (1954).
Key, J. A. See Odell, R. T.
Kincaid, J. F., Strong, J. S. and Sunderman, F. W.: A.M.A. Arch. Indust. Hyg. 8: 48-60 (1953).
King, J. T., Casas, C. B. and Visscher, M. B.: Cancer Res. 9: 436-437 (1949).
Kinney, T. D. See Kaufman, N.

Kirby, A. H. M.: Cancer Res. 7: 263-267 (1947a).
: Cancer Res. 7: 333-341 (1947b).
: Biochem. J. 42: lv (1948a).
: Brit. J. Cancer 2: 7-74 (1948b).
: Brit. J. Cancer 2: 290-294 (1948c).
: Brit. J. Cancer 2: 294-300 (1948d).
: Brit. J. Nutrition 3: ix (1949).
Kirby, A. H. (M.) and Peacock, P. R.: Glasgow M. J. 30: 364-372 (1949).
Kirkman, H.: Cancer Res. 12: 274-275 (1952).
Kirkman, H. and Bacon, R. L.: Anat. Rec. (Suppl.) 103: 475-476 (1949).
: Cancer Res. 10: 122-123 (1950).
: J. Nat. Cancer Inst. 13: 745-755 (1952a).
: J. Nat. Cancer Inst. 13: 757-771 (1952b).
Kirschbaum, A.: Cancer Res. 9: 93-95 (1949).
Kirschbaum, A. and Shapiro, J. R.: Cancer Res. 11: 264 (1951).
Kirschbaum, A., Shapiro, J. and Mixer, H. W.: Proc. Soc. Exper. Biol. & Med. 72: 632-634 (1949).
: Cancer Res. 13: 262-268 (1953).
Kirschbaum, A. See Frantz, M. J.; Mixer, H. W.; Shapiro, J. R.
Kishi, S. and Haruno, K.: Chem. Ber. 85: 836-840 (1952).
Kitamura, H. See Kawai, K.; Taki, I.
Kitzmiller, K. V. See Deichmann, W. B.; Treon, J. F.
Kjerulf-Jensen, K.: Acta pharmacol. et toxicol. 4: 248-250 (1948).
Klahm, G. R. See Brown, B. B.
Klamerth, O.: Arkiv Kemi 5: 565-567 (1953).
Klatskin, G., Gewin, H. M. and Krehl, W. A.: Yale J. Biol. & Med. 23: 317-331 (1951).
Klein, M.: J. Nat. Cancer Inst. 11: 834-848 (1951a).
: J. Nat. Cancer Inst. 11: 985-996 (1951b).
: J. Nat. Cancer Inst. 12: 735-742 (1951c).
: J. Nat. Cancer Inst. 12: 1003-1010 (1952a).
: J. Nat. Cancer Inst. 13: 333-341 (1952b).
: Cancer Res. 13: 427-430 (1953a).
: J. Florida Acad. Sc. 16: 157-161 (1953b).
: J. Nat. Cancer Inst. 14: 83-92 (1953c).
Kleinenberg, G. E.: Arkh, biol. Nauk 62: 30-34 (1941).
Kleinsorg, H., Kopf, R. and Loeser, A.: Deutsche med. Wchnschr. 74: 1525-1527 (1949).
Klenitskii, Y. S.: Akusherstvo i Ginekol. No. 2: 32-35 (1950).
Kline, B. E. See Miller, E. C.; Rusch, H. P.
Klug, H. L. See Hendrick, C.
Knobil, E., Hofmann, F. G. and Greep, R. O.: Endocrinology 53; 242-244 (1953).
Kobernick, S. D., Toovey, E. W. and Webster, D. R.: Cancer Res. 12: 591-593 (1952).
Kochakian, C. D.: Proc. Soc. Exper. Biol. & Med. 80: 386-388 (1952).
Kochakian, C. D., Humm, J. H. and Bartlett, M. N.: Am. J. Physiol. 155: 242-250 (1949).
Kochakian, C. D. and Robertson, E.: J. Biol. Chem. 190: 495-503 (1951).
Kochakian, C. D. and Stettner, C. E.: Am. J. Physiol. 155: 255-261 (1948).
Kochakian, C. D. See Humm, J. H.
Kolesnik, V. S. See Grushko, Y. M.
Kolonits, B.: Magyar Orvosi Arch. 45: 39-51 (1944).
Koltay, M. See Benko, S.
Komarov, S. A. See Shay, H.
Kon, G. A. R. See Haddow, A.
Kondo, H.: Shikoku acta med. 2: 298-303 (1951).
Kono, K.: Shikoku acta med. 4: 151-163 (1953).
Kopf, R., Loeser, A. and Meyer, G.: Arch. exper. Path. u. Pharmakol. 212: 405-415 (1951).
Kopf, R., Loeser, A., Meyer, G., and Franke, W.: Arch. exper. Path. u. Pharmakol. 210: 346-360 (1950).
Kopf, R. See Kleinsorg, H.
Koppisch, E. See Casas, C. B.
Korenchevsky, V.: J. Path. & Bact. 62: 53-60 (1950).
Korpassy, B.: Bull. Assoc. franç étude cancer 37: 52-56 (1950).
Korpassy, B. and Kovacs, K.: Brit. J. Exper. Path. 30: 266-272 (1949).
Korpassy, B. and Mosonyi, M.: Brit. J. Cancer 4: 411-420 (1950a).
: Orvosi hétilap 91: 257-259 (1950b).
: Acta morphol., Hung. 1: 37-54 (1951a).
: Lancet 260: 1416-1417 (1951b).
Korson, L. See Novikoff, A. B.
Kortge, P. See Kessel, M.
Korting, G. See Hammerschmidt, E.
Kovacs, K. See Korpassy, B.
Kozelka, F. L. See Pedrero, E., Jr.
Kraft, S. C. See Jones, R. J.
Kraus, S. D., Weintrab, S., Wright, L. T. and Hjelt, I.: Proc. Soc. Exper. Biol. & Med. 76: 489-493 (1951).
Krehl, W. A. See Klatskin, G.
Kretchmer, N. and Barnum, C. P.: Cancer Res. 9: 564 (1949).
Kretchmer, N. See Robertson, W. V. B.
Krichesky, B. See Furlong, E.; Graeff, I.
Kridelbaugh, W. See Osborn, M.
Kroc, R. L. See Scott, C. C.
Krohn, P. L.: Endocrinology 45: 537-543 (1949).
Kroon, D. B. Acta endocrinol. 2: 227-248 (1949).
Krotkina, N. A.: Arkh. Pat. 10: 38-42 (1948).

Kuhn, R. and Quadbeck, G.: Ztschr. Krebsforsch. 56: 242-246 (1949).
Kuizenga, M. H. See Vander Brook, M. J.
Kunze, F. M. Fitzhugh, O. G.; Laug, E. P.
Kupke, D. W. See Griffin, A. C.
Kupperman, H. S. and Greenblatt, R. B.: Exper. Med. & Surg. 6: 156-166 (1948).
Kurokawa, M. See Ozaki, K.
Kuyper, A. C. See Orten, J. M.

L

L'Abbate, S. See Ottaviano, G.
Lacassagne, A., Buu-Hoi, N. P., Hoan, N. and Rudali, G.: Compt. rend. Acad. sc. 226: 1852-1853 (1948a).
Lacassagne, A.: Compt. rend. Soc. biol. 121:607-609 (1936c).
: Compt. rend. Soc. biol. 122: 183-184 (1936d).
Lacassagne, A., Buu-Hoi, N. P., Lecocz, J. and Rudali, G.: Bull. Assoc. franç étude cancer 34: 22-29 (1947).
Lacassagne, A., Buu-Hoi, N. P., Royer, R. and Zajdela, F.: Compt. rend. Soc. biol. 142: 481-483 (1948b).
Lacassagne, A., Buu-Hoi, N. P. and Rudali, G.: Compt. rend. Soc. biol. 145: 1451-1453 (1951).
Lacassagne, A., Buu-Hoi, N. P., Zajdela, F. and Xuong, N. D.: Bull. Assoc. franç. étude cancer 42: 3-13 (1955).
Lacassagne, A., Corre, L., Buu-Hoi, N. P. and Royer, R.: Compt. rend. Soc. biol. 146: 399-402 (1952).
Lacassagne, A. See Rudali, G.
Lacour, F. See Oberling, C.; Pfaltz, K. R.
Ladd, A. T. See Kellner, A.
Laird, A. K. and Miller, E. C.: Cancer Res. 13: 464-470 (1953).
Lambers, K.: Arch. Path. Anat. 321: 88-100 (1951).
Lands, A. M. See Dertinger, B. L.; Hoppe, J. O.
Langecker, H., Schumann, H. J. and Junkmann, K.: Naunyn-Schmiedebergs Arch. exper. Path. u. Pharmakol. 219: 130-137 (1953).
Langemann, H. See Kensler, C. J.
Lansing, A. I., Rosenthal, T. B. and Kamen, M. D.: Arch. Biochem. 19: 177-183 (1948).
Laqueur, G. L.: Cancer Res. 9: 247-255 (1949).
Largent, E. J. See Ashe, W. F.; Dutra, F. R.
Larizza, P. and Chirico, G.: Arch. sc. med. 96: 125-136 (1953).
Larsen, C. D.: Cancer Res. 7: 726 (1947).
: J. Nat. Cancer Inst. 9: 35-37 (1948).
Larsen, C. D. See Mostofi, F. K.
Larson, L. G. See Sylvén, B.
Larson, P. S. See Finnegan, J. K.; Haag, H. B.; Smith, R. B., Jr.
Laskin, S. See Hall, R. H.
Lauber, H. J., Hildebrand, E. and Schocke, H.: Ztschr. Krebsforsch. 48: 447-450 (1939b).
Laug, E. P.: J. Pharmacol. & Exper. Therap. 93: 277-281 (1948).
Laug, E. P., Nelson, A. A., Fitzhugh, O. G. and Kunze, F. M.: J. Pharmacol. & Exper. Therap. 98: 268-273 (1950).
Laug, E. P. See Fitzhugh, O. G.
Laurens, J. and Bacon, H. E.: J. Nat. Cancer Inst. 12: 1237-1244 (1952).
Lavedan, J. P. See Cheymol, J.
Law, L. W.: J. Nat. Cancer Inst. 12: 1119-1126 (1952).
Law, L. W. and Miller, J. H.: J. Nat. Cancer Inst. 11: 425-437 (1950).
Leathem, J. H.: Proc. Penna. Acad. Sc. 23: 99-103 (1949).
: Cancer Res. 11: 266 (1951).
Leathem, J. H. and Allison, J. B.: Proc. Am. A. Cancer Res. 1: 32 (1953).
Leathem, J. H. and Barken, H. B.: Cancer Res. 10: 231 (1950).
Leathem, J. H. See Allison, J. B.
Leblond, C. P. See Axelrad, A.; Grad, B.
Le Breton, E. See Clement, G.
Leduc, E. H. See Wilson, J. W.
Lee, C. S., Stowell, R. E. and Villisana, A.: Cancer Res. 9: 600 (1949).
Lee, C. S. See Stowell, R. E.
Lee, R. B. See Sellers, E. A.
Leftwich, C. I., Jr. See Mirick, G. S.
Leftwich, W. B. See Mirick, G. S.
Lehman, A. J. See Bauer, R. O.
Lehmann, G.: J. Pharmacol. & Exper. Therap. 92: 249-259 (1948).
Lehmann, G. See Randall, L. O.
Leone, V.: Tumori 39: 420-442 (1953).
Lester, D. and Greenberg, L. A.: A.M.A. Arch. Indust. Hyg. 2: 335-344 (1950).
Lester, D. See Greenberg, L. A.
Levasseur, C. See Tuckmann-Duplessis, H.
LeVeen, H. H. and Barberio, J. R.: Ann. Surg. 129: 74-84 (1949).
Levillain, W. D. See Heston, W. E.
Levine, M. D. See Dudley, H. C.
Levy, B. M., Gorlin, R. and Gottsegen, R.: J. Nat. Cancer Inst. 12: 275-285 (1951).
Levy, B. M. and Ring, J. R.: Oral Surg. 3: 233 (1950a).
: Oral Surg. 3: 262-271 (1950b).
Lewis, J. R. See Barlow, O. W.
Lewis, M. N. See Ercoli, N.

Lewis, R. A., DeMajo, S. and Rosemberg, E.: Endocrinology 45: 564-570 (1949).
Li, M. H. and Gardner, W. U.: Cancer Res. 9: 35-41 (1949).
Lichner, G. and Szontagh, F.: Kiserl. Orvostud. 1: 209-211 (1949).
Liegeois, F. See Dallemagne, M. J.
Light, A. E. and Tornaben, J. A.: J. Nutrition 49: 51-63 (1953a).
: J. Nutrition 51: 365-379 (1953b).
Lillie, R. B. See Stohlman, E. F.
Lindeman, G. See von Euler, B.
Lindeman, V. F. See Burlington, H.
Lindner, A. and Müller, A.: Scientia Pharmaceutica 22: 224-228 (1954).
Lindner, A. and Woelkel, O.: Ztschr. Vitamin-, Hormon- u. Fermentforsch. 4: 43-48 (1951).
Lindsley, B. F. See Dudley, H. C.
Linell, F.: Acta path. et microbiol. scandinav. 27: 662-670 (1950).
Linell, F. and Nordén, J. G.: Acta path. et microbiol. scandinav. 27: 394-413 (1950).
: Acta path. et microbiol. scandinav. 31: 492-500 (1952a).
: Acta path. et microbiol. scandinav. 31: 501-507 (1952b).
Lipschütz, A. and Vargas, L., Jr.: Compt. rend. Soc. biol. 130: 596-599 (1939b).
Lipschütz, A. See Bruzzone, S.; Iglesias, R.
Li Voti, P. and Mutolo, V.: Tumori 34: 71-81 (1948).
Loeser, A. See Husing, E., Kleinsorg, H.; Kopf, R.,
Logothetopoulos, J. See Doniach, I.
Lombardi, B. See Perissinotto, B.
Lopez, M. See Mazzanti, L.
Loquvam, G. S. See Russell, W. O.
Lorenz, E. and Stewart, H. L.: J. Nat. Cancer Inst. 9: 173-180 (1948).
Lorenz, E. See Hare, W. V.; Heston, W. E.; Stewart, H. L.
Lorenzoni, L. See Baglioni, T.
Louedec, A. See Pascaud, M.
Lowenhaupt, E.: Cancer Res. 9: 121-126 (1949).
Lowenhaupt, E. See Brodie, D. C.
Lowenthal, M. See Robbard, S.
Lu, Y.: Chinese J. Physiol. 17: 301-306 (1950).
Lucas, C. C. See Best, C. H.; Sellers, E. A.
Luce-Clausen, E. M. See Morton, J. J.
Luck, J. M. See Cunningham, L.; Eldredge, N. T.
Ludwig, B. J. See Berger, F. M.
Lusky, L. M. See Nelson, A. A.
Luthy, F. See Ruedi, L.
Lutz, B. R., Fulton, G. P., Patt, D. I., Handler, A. H. and Stevens, D. F.: Cancer Res. 11: 64-66 (1951).

M

Ma, C. K.: Cancer Res. 9: 481-487 (1949).
MacDonald, J. C., Miller, E. C., Miller, J. A. and Rusch, H. P.: Cancer Res. 12: 50-54 (1952).
Macko, E. See Fellows E. J.
Maddock, C. E. See Craig, J. M.
Madsen, M. E. See Dunning, W. F.
Maguigan, W. H. See Spitz, S.
Mahoney, E. B. See Morton, J. J.
Main, R. J. See Haag, H. B.
Maisin, J.: Scientia 86: 20-31 (1951).
Maisin, J. and Beeckmans, M. L.: Compt. rend. Soc. biol. 142: 569-572 (1948).
Maisin, J. and Meersseman, F.: Compt. rend. Soc. biol. 144: 442-444 (1950).
Maisin, J. See Meersseman, F.
Malcolm, J., Griesbach, W. E., Bielschowsky, F. and Hall, W. H.: Brit. J. Exper. Path. 30: 17-23 (1949).
Mallette, F. S. and von Hamm, E.: A.M.A. Arch. Indust. Hyg. 6: 231-236 (1952).
Malmgren, R. A. and Saxen, E. A.: J. Nat. Cancer Inst. 14: 411-421 (1953).
Mancini, R. See Membrives, J. R.
Mancuso, T. F.: Am. J. Pub. Health, Oct. 1949.
Manjon, F.: Rev. Fac. cien. quim. univ. nac. LaPlata 22: 67-77 (1947) (Pub. 1949)
Mann, S. See Haley, T. J.
Marchant, J. and Orr, J. W.: Brit. J. Cancer 7: 239-341 (1953).
Mardones, E. and Iglesias, R.: Bol. Soc. de biol. Santiago, Chile 8: 142-144 (1951).
Mardones, E. See Iglesias, R.
Marfori, L., Vulterini, S. and Napoleone, N.: Rass. fisiopat. clin. (Pisa) 22: 31-40 (1950).
Margolis, H. M., Fetterman, G. H. and Caplan, P. S.: Am. J. M. Sc. 218: 121-132 (1949).
Mariani, P. L. See Corre, L.; Rudali, G.
Mark, D. D.: A.M.A. Arch. Path. 49: 545-554 (1950).
Marks, E. K. See Jacobson, L. O.
Marks, G. See Shils, M. E.
Marrer, H. H. See Dudley, H. C.
Marshall, A. H. E.: Acta path. et microbiol. scandinav. 33: 1-9 (1953).
Marshall, E. K., Jr. and Dearborn, E. H.: Bull. Johns Hopkins Hosp. 87: 36-49 (1950).

Martin, E. W. See Harrison, J. W. E.
Martinez, C.: Rev. Soc. argent. biol. 27: 14-18 (1951).
Martinez, C. See Rodriguez, R. R.
Martinova, R. P. and Shabad, L. M.: Arkh. Pat. 11: No. 3, 36-39 (1949).
Marx, H. E. See Shay, H.
Marx, L. See Marx, W.; Weiss, S. B.
Marx, W., Marx, L. and Deuel, H. J.: Am. Heart J. 42: 124-128 (1951).
Marx, W. See Weiss, S. B.
Marzullo, F. and Russo, S.: Arch. ital. anat. e istol. pat. (Bologna) 22: 32-36 (1949).
Masin, F.: Acta cien. venezolani 1: 116-120 (1950).
Mason, K. E. See Hodge, H. C.
Masturzo, A.: Folia med. (Naples) 32: 531-532 (1949).
: Folia med. (Naples) 33: 543-553 (1950).
Matko, L. See Kellner, B.
Matoltsy, A. G.: Arch. biol., Hung. 17: 179-185 (1947).
Maun, M. E. See Dunning, W. F.
Maw, G. A. and du Vigneaud, V.: J. Biol. Chem. 176: 1029-1036 (1948).
Maynard, E. A. See Hall, R. H.; Hodge, H. C.; Woislawski, S.
Mazer, A. See Benelli, C.
Mazzanti, L. and Lopez, M.: Boll. Soc. ital. biol. sper. 28: 975-978 (1952).
McCafferty, D. E. See Meechan, R: J.
McCallin, P. F. See Taylor, E. S.
McClelland, J. M. See Shimkin, M. B.
McClure, J. A. and Higgins, C. C.: J.A.M.A. 146: 7-9 (1951).
McCollister, D. D. See Adams, E. M.; Rowe, V. K.; Spencer, H. C.
McDonald, J. G.: Cancer Res. 7: 305-309 (1947).
McDougle, H. C. See Neal, M. P.
McGibbon, W. H. See Adams, J. L.
McGinnis, G. E. See Wolfee, J. B.
McGovern, V. J. See Read, G.
McGowan, L. J. and Bishop, C. J.: Cancer Res. 13: 646-650 (1953).
McKinney, S. E., Peck, H. M., Bochey, J. M., Byham, B. B., Schuchardt, G. S. and Beyer, K. H.: J. Pharmacol. & Exper. Therap. 102: 208-214 (1951).
McLean, R. A. See Fellows, E. J.
Mecke, R. See Schmahl, D.
Meechan, R. J., McCafferty, D. E. and Jones, R. S.: Cancer Res. 13: 802-806 (1953).
Meek, G. A. See Franks, W. R.
Meersseman, F. and Maisin, J.: Acta Unio internat. contra cancrum 7: 330-336 (1951).
Meersseman, F. See Maisin, J.
Meisel, M. N. and Zavarzina, N. B.: Zhur. Obshchei biol. 8: 52-97 (1947).
Melby, R. See Sandin, R. B.
Melczer, M.: Orvosi hétilap 90: 161-163 (1949).
Mellors, R. C. and Hlinka, J.: Cancer 5: 242-248 (1952).
Melon, J. See Dallemagne, M. J.
Membrives, J. R., dePasqualini, C. E. D., Bur, E. and Mancini, R.: Rev. Soc. argent. biol. 28: 164-173 (1952).
Mendeléeff, P.: Compt. rend. Soc. biol. 144: 301-302 (1950).
Meneely, G. R., Tucker, R. G. and Darby, W. J.: J. Nutrition 48: 489-498 (1952).
Meneely, G. R., Tucker, R. G., Darby, W. J. and Auerbach, S. H.: Ann. Int. Med. 39: 991-998 (1953a).
: J. Exper. Med. 98: 71-80 (1953b).
Mercier-Parot, L. See Tuchmann-Duplessis, H.
Meyer, B. J.: South African J. M. Sc. 14: 89-133 (1949).
Meyer, G. See Kopf, R.
Mider, G. B. See Morton, J. J.
Migliarese, J. F. See Allison, J. B.
Migone, A. See Acevedo, D.
Millar, M. J. See Noble, R. L.
Miller, A. J. See Stamler, J.
Miller, E. C., Miller, J. A., Kline, B. E. and Rusch, H. P.: J. Exper. Med. 88: 89-98 (1948).
Miller, E. C., Miller, J. A., Sandin, R. B. and Brown, R. K.: Cancer Res. 9: 504-509 (1949).
Miller, E. C. See Laird, A. K.; MacDonald, J. C.; Miller, J. A.; Price, J. M.; Sandin, R. B.; Schweigert, B. S.; Sorof, S.
Miller, J. A. and Miller, E. C.: J. Exper. Med. 87: 139-156 (1948).
Miller, J. A., Miller, E. C. and Finger, G. C.: Cancer Res. 13: 93 (1953).
Miller, J. A., Sandin, R. B., Miller, E. C. and Rusch, H. P.: Cancer Res. 15: 188-199 (1955).
Miller, J. A., Sapp, R. W. and Miller, E. C.: Cancer Res. 9: 652-660 (1949).
Miller, J. A. See MacDonald, J. C.; Miller, E. C.; Price, J. M.; Sandin, R. B.; Schweigert, B. S.; Sorof, S.
Miller, J. H. See Law, L. W.
Miller, R. and Jung, F.: Parmazie 7: 822-823 (1952).
Miller, R. F. and Phillips, P. H.: J. Nutrition 51: 273-281 (1953).
Miller, W. L. and Baumann, C. A.: Cancer Res. 11: 634-639 (1951).
Miller, W. L., Jr. See Rumsfeld, H. W., Jr.
Minatoya, H. and Hoppe, J. O.: J. Am. Pharm. A. (Scient. Ed.) 40: 394-398 (1951).

Mirick, G. S., Smith, J. M., Leftwich, C. I., Jr. and Leftwich, W. B.: J. Exper. Med. 147-160 (1952).
Mirone, L. and Wade, W. M.: Am. J. Physiol. 175: 11-12 (1953).
Mitchell, D. F.: J. Dent. Res. 29: 386-391 (1950).
Miura, K.: See Miyamoto, Y.
Mixer, H. W. and Kirschbaum, A.: Radiology 50: 476-480 (1948).
Mixer, H. W. See Kirschbaum, A.
Miyaji, T. See Ozaki, K.
Miyamoto, Y.; Miura, K.; K. Yamasaki, and Iidaka, K.: Kekkaku (Tuberculosis) 28: 800-802 (1953).
Mizoguchi, K.: Osaka Diagaku Igaku Zasshi 4: 117-124 (1952).
Modest, E. J. See Szmuszkovicz, J.
Monaco, A. R. See von Oettingen, W. F.
Monche, J. and Vidal-Sivilla, S.: Rev. españ. fisiol. 6: 1-4 (1950).
Money, W. L., Fitzgerald, P. J., Godwin, J. T. and Rawson, R. W.: Cancer 6: 111-120 (1953).
Money, W. L. and Rawson, R. W.: Cancer 3: 321-335 (1950).
Montagna, W., Kenyon, P. and Hamilton, J. B.: J. Exper. Zoology 110: 379-395 (1949).
Moon, H. D., Simpson, M. E. and Evans, H. M.: Science 116: 331 (1952).
Moon, H. D. See Gordan, G. S.; Hine, C. H.
Moore, D. J. See Caskey, W. H.
Moore, G. E., Brackney, E. L. and Bock. F. G.: Proc. Soc. Exper. Biol. & Med. 82: 643-645 (1953).
Moore, J. G. See Hine, C. H.
Moore, J. P. See Williams, G. Z.
Moracci, E. and Bracale, U.: Arch. ostet. e ginec. 53: 308-318 (1948).
: Abstracts World Surg., Obstet. & Gynaecol. 5: 380-381 (1949).
Moretti, G. P. and Bellini, L.: Boll. Soc. ital. biol. sper. 27: 966-968 (1951).
Morgan, W. C.: J. Nat. Cancer Inst. 11: 263-268 (1950).
Mori, K. and Shimojo, K.: Science 117: 683-684 (1953).
Moricard, R. and Gothie, S.: Acta Unio internat. contra cancrum 7: 341-343 (1951).
Mori-Chavez, P. See White, J.
Moro, F.: Boll. Soc. ital. biol. sper. 25: 490-493 (1949).
Morrione, T. G. See Pearson, B.
Morris, H. P. and Dubnik, C. S.: Cancer Res. 10: 233 (1950).
Morris, H. P., Dubnik, C. S., Dunn, T. B. and Westfall, B. B.: Acta Unio internat. contra cancrum 6: 47-51 (1948a).
Morris, H. P., Dubnik, C. S. and Johnson, J. M.: J. Nat. Cancer Inst. 10: 1201-1213 (1950a).
Morris, H. P., Dunn, T. B. and Dubnik, C. S.: J. Nat. Cancer Inst. 9: 225-228 (1948b).
Morris, H. P. and Eyestone, W. H.: J. Nat. Cancer Inst. 13: 1139-1165 (1952).
Morris, H. P., Firminger, H. I. and Green, C. D.: Cancer Res. 11: 270 (1951).
Morris, H. P., Green, C. D. and Dalton, A. J.: J. Nat. Cancer Inst. 11: 805-815 (1950b).
Morris, H. P. See Dalton, A. J.; Dubnik, C. S.; Weisburger, J. H.
Morse, M. See Hine, C. H.
Morton, J. J., Mider, G. B., Luce-Clausen, E. M. and Mahoney, E. B.: Cancer Res. 11: 559-561 (1951).
Mosinger, M.: Compt. rend. Soc. biol. 141: 816-818 (1947).
: Compt. rend. Soc. biol. 146: 1351-1352 (1952).
Mosinger, M. and Novo, J.: Actas reun. biol. Portug. 2: 185-189 (1947).
Mosonyi, M. A. See Korpassy, B.
Mostofi, F. K. and Larsen, C. D.: Am. J. Path. 25: 807-808 (1949a).
: Cancer Res. 9: 544 (1949b).
: Am. J. Clin. Path. 21: 342-348 (1951a).
: J. Nat. Cancer Inst. 11: 1187-1221 (1951b).
Mostofi, F. K. See Bennison, B. E.
Mottram, J. C.: Am. J. Cancer 32: 76-79 (1938).
Mountain, J. T., Delker, L. L. and Stokinger, H. E.: A.M.A. Arch. Indust. Hyg. 8: 406-411 (1953).
Mouriquand, G. and Edel, V.: Comp. rend. Soc. biol. 145: 1322-1324 (1951).
Moyer, J. H. See Handley, C. D.
Muck, J. See Iversen, M.
Mueller, J. H.: Schweiz. med. Wchnschr. 24: 556 (1949).
Mühlbock, O. Acta endocrinol. 3: 105-110 (1949).
Mühlbock, O. F. E.: Nederl. tijdschr. geneesk. 94: 3498-3502 (1950a).
: Nederl. tijdschr. geneesk. 94: 3747-3752 (1950b).
Muhler, J. C. Nebergall, W. H. and Day, H. G.: J. Am. Dent. A. 46: 290-295 (1953).
Muhler, J. C. See Radike, A. W.
Mulay, A. S. and Congdon, C. C.: J. Nat. Cancer Inst. 14: 571-583 (1953).
Mulay, A. S. and Firminger, H. I.: Fed. Proc. 8: 363 (1949).
: J. Nat. Cancer Inst. 12: 917-927 (1952a).
: J. Nat. Cancer Inst. 13: 35-55 (1952b).
: J. Nat. Cancer Inst. 13: 57-72 (1952c).
Mulay, A. S. and Saxén, E. A.: J. Nat. Cancer Inst. 13: 1259-1273 (1952).
Mulay, A. S. See Firminger, H. I.; Symeonidis, A.

Mulines, M. G., Connant, C. and Hauser, E.: Bull. New York M. Coll. 16: 92-101 (1953).
Müller, A. See Lindner, A.
Müller, H. A. See Kaufmann, C.
Mulligan, R. M. and Becker, D. L.: Am. J. Path. 23: 298-311 (1947).
Muñiz, J. Z.: Semana méd. 11: 799-804 (1948).
Muñiz, J. Z. and Dominguez, C. M.: Semana méd. 1: 804-811 (1949).
Murphy, J. B. and Sturm, E.: Cancer Res. 9: 88-89 (1949).
Murray, M. M.: Bull. World Health Organ. 9: 211-216 (1953).
Murray, M. M. See Bond, A. M.
Mutolo, V. See Li Voti, P.

N

Nadel, E. M.: J. Nat. Cancer Inst. 10: 1043-1065 (1949).
Nagata, T. and Kojima, T.: Vitamins (Japan) 5: 206 (1952).
Nager, G. See Ruedi, L.
Nair, J. H. See Carpenter, C. P.
Nakajima, T. See Ozaki, K.
Nale, T. W. See Weil, C. S.
Napoleone, N. See Marfori, L.
Nash, P.: Lancet 258: 519 (1950).
Nath, M. C., Brahmachari, H. D. and Gopalkrishna, A.: Science 112: 92 (1950).
Nau, C. A. See Dernehl, C. U.
Neal, M. P., McDougle, H. C. and Sweets, H. H., Jr.: South. M. J. 42: 1048-1050 (1949).
Nebergall, W. H. See Muhler, J. C.
Neidhardt, H. W. See Dernehl, C. U.
Nelson, A. A. and Fitzhugh, O. G.: A.M.A. Arch. Path. 45: 454-462 (1948).
Nelson, A. A. and Lusky, L. M.: Proc. Soc. Exper. Biol. & Med. 76: 765-767 (1951).
Nelson, A. A. and Woodard, G.: Fed. Proc. 7: 276-277 (1948).
: A.M.A. Arch. Path. 48: 387-394 (1949).
: J. Nat. Cancer Inst. 13: 1497-1509 (1953).
Nelson, A. A. See Draize, J. H.; Fitzhugh, O. G.; Laug, E. P.; Radomski, J. L.
Nettleship, A. and Smith, A. G.: Proc. Soc. Exper. Biol. & Med. 74: 800-802 (1950).
Newell, G. W., Petretti, A. K. and Reiner, L.: J. Invest. Dermat. 13: 145-159 (1949).
Newman, H. J. See Sturkie, P. D.
Nichols, C. N. See Siperstein, M. D.
Nichols, C. W., Jr. See Siperstein, M. D.
Nickerson, M. See Wang, C. Y.
Nickson, J. J. See Cloudman, A. M.
Nicod, J. L. See Danchakov, V.
Nishikawa, M. See Setsuda, T.
Nissim, J. A.: Nature 171: 1157 (1953).
Njaa, L. R. and Braekkan, O. R.: Fiskeridirect. Skrift. 2: 3-14 (1953).
Noble, R. L. and Collip, J. B.: Canad. M. J. 44: 1-5 (1941).
Noble, R. L. and Millar, M. J.: Nature 162: 253-254 (1948).
Noel, R. See Jacquemain, R.
Nordén, J. G.: Nord. med. 40: 1949-1950 (1948).
Nordén, J. G. See Linell, F.
Nordmann, J., Nordmann, R., and Gauchery, O.: Bull. Soc. chim. biol. 34: 77-85 (1952).
Nordmann, J. See Bertrand, I.
Nordmann, R. See Bertrand, I.; Nordmann, J.
Noring, O. See Iversen, S.
Nothdurft, H.: Naturwiss. 42: 75-76 (1955).
Novikoff, A. B., Pearson, B. and Korson, L.: Cancer Res. 11: 272-273 (1951).
Novikoff, A. B. See Pearson, B.
Novo, J. See Mosinger, M.

O

Oberling, C. and Guérin, M.: Bull. Assoc. franç. étude cancer 37: 5-14 (1950).
Oberling, C., Guérin, M., deSeze, L., and Lacour, Mme., Bull. Assoc. franç. étude cancer 37: 176-192 (1950).
Oberling, C. See Roussy, G.
O'Brien, J. L. See Richards, R. K.
Odell, R. T. and Key, J. A.: Ann. Surg. 138: 461-466 (1953).
O'Flynn, C. P.: Med. J. Australia 1: 356-359 (1950).
: Med. J. Australia 1: 182-187 (1951).
Oga, T. See Setsuda, T.
Ogilvie, A. L.: J. Dent. Res. 32: 386-397 (1953).
Ogino, S.; Yamada, Y. and Ichihara, F.: Acta Soc. Ophth. Japan 56: 1281-1285 (1952)
Olson, K. J. See Vander Brook, M. J.
Olson, O. E. See Hendrick, C.
O'Neal, L. W. and Heinbecker, P.: Endocrinology 53: 239-241 (1953).
O'Neal, M. A. M. See Griffin, A. C.; Robertson, C. H.
Onufrio, O.: Folia med. 24: 1245-1255 (1938).
Oppenheimer, B. S., Oppenheimer, E. T. and Stout, A. P.: Tr. A. Am. Physicians 61: 343-348 (1948a).
: Proc. Soc. Exper. Biol. & Med. 67: 33-34 (1948b).
: Proc. Soc. Exper. Biol. & Med. 79: 366-369 (1952).
Oppenheimer, E. T. See Oppenheimer, B. S.
Orr, J. W.: Nature 162: 189 (1948).
: Acta Unio internat. contra cancrum 7: 294-298 (1951).

Orr, J. W. See Billingham, R. E.; Dmochowski, L.; Marchant, J.
Ortega, L. R. See Russell, W. O.
Orten, J. M. and Bucciero, M. C.: J. Biol. Chem. 176: 961-968 (1948).
Orten, J. M., Kuyper, A. C. and Smith, A. H.: Food Technology 2: 308-316 (1948).
Orten, J. M. See Bucciero, M. C.
Orts, F. M. See Baguena, M. B.
Osborn, M., Womack, N. A., Daum, K. and Kridelbaugh, W.: A. M. A. Arch. Path. 52: 546-551 (1951).
Oster, K. A. See Sweeney, K. M.
Ottaviano, G. and L'Abbate, S.: Boll. soc. ital. biol. sper. 29: 1219-1222 (1953).
Overholser, M. D. See Harsh, R.
Ozaki, K., Miyaji, T., Kurokawa, M. and Nakajima, T.: Igaku to Seibutsugaku (Med. and Biol.) 10: 309-311 (1947).

P

Page, I. H. and Brown, H. B.: Circulation 6: 681-687 (1952).
Pallas, W. C. See Taylor, E. S.
Palmer, G. H. See Small, C. S.
Palmer, J. G., Eichwald, E. J., Cartwright, G. E. and Wintrobe, M. M.: Blood 8: 72-80 (1953).
Pan, S. C. and Gardner, W. U.: Cancer Res. 8: 337-345 (1948a).
: Cancer Res. 8: 613-623 (1948b).
: Cancer Res. 9: 549 (1949).
P'an, S. Y.: Proc. Soc. Exper. Biol. & Med. 68: 488-492 (1948).
P'an, S. Y., Halley, T. V., Reilly, J. C. and Pekich, A. M.: Am. Rev. Tuberc. 63: 44-48 (1951).
P'an, S. Y., Reilly, J. C., Halley, T. V., Richard, G. H., Pekich, A. M. and Pollets, H. A.: J. Pharmacol. & Exper. Therap. 99: 234-244 (1950a).
P'an, S. Y., Scaduto, L. and Cullen, M.: Ann. New York Acad. Sc. 53: 238-244 (1950b).
P'an, S. Y. See Gardocki, J. F.
Paquin, H. O., Jr. See Child, G. P.
Pardoe, A. U.: Brit. J. Pharmacol. 7: 349-357 (1952).
Pardoe, A. U. and Weatherall, M.: Brit. J. Pharmacol. 7: 358-369 (1952).
Parker, V. H., Barnes, J. M. and Denz, F. A.: Brit. J. Indust. Med. 8: 226-235 (1951).
Parkes, M. M. and Wrigley, F.: Brit. M. J. 1: 670-675 (1951).
Parola, P. L. See Ghiringhelli, C.
Parsons, J. T. See Dinning, J. S.
Pascaud, M. and Louedec, A.: Compt. rend. Soc. biol. 147: 1596-1597 (1953).
Pascaud, M. See Clement, G.
Paschkis, K. E. and Cantarow, A.: Science 114: 264-265 (1951).
Paschkis, K. E., Cantarow, A. and Stasney, J.: Cancer Res. 8: 257-263 (1948).
: Science 114: 264-265 (1951).
Paschkis, K. E., Rutman, R. J. and Cantarow, A.: Cancer Res. 12: 286-287 (1952).
Paschkis, K. E. See Cantarow, A.; D'Angelo, S. A.; Stasney, J.
Pasqualini, C. D. See de Pasqualini, C. D.
Patellani, E., Fuortes, C. and Guzzardella, C.: Tumori 25: 492-504 (1951).
Paton, W. D. and Zaimis, E.: Brit. J. Pharmacol. 4: 381 (1949).
Patt, D. I. See Lutz, B. R.
Patwardhan, V. N. See Phatak, S. S.
Paver, H., Robertson, A. and Wilson, J.E.: J. Comp. Path. & Therap. 63: 31-47 (1953).
Pavlova, E. B. See Yabak, Y. M.
Payne, H. G., Spencer, J. N. and Schultz, F. H., Jr.: Antibiotics & Chemother. 1: 387-391 (1951).
Payne, L. D. See Day, P. L.
Payne, T. P. and Duff, G.L.: A. M. A. Arch. Path. 51: 379-386 (1951).
Peacock, A. and Peacock, P. R.: Brit. J. Cancer 3: 289-295 (1949).
Peacock, P. R.: Brit. J. Nutrition 2: 201-204 (1948).
Peacock, P. R., Beck, S. and Anderson, W.: Brit. J. Cancer 3: 296-305 (1949).
Peacock, P. R. See Kirby, A. H.; Peacock, A.
Peake, E. G. See Heppel, L. A.
Pearson, B. and Morrione, T.: Cancer Res. 9: 564 (1949).
Pearson, B., Novikoff, A. B. and Morrione, T. G.: Cancer Res. 10: 557-564 (1950).
Pearson, B. See Novikoff, A. B.
Peck, H. M. See McKinney, S. E.
Pecora, L.: Folia med. (Naples) 32: 489-503 (1949a).
: Folia med. (Naples) 32: 504-507 (1949b).
Pedrero, E., Jr. and Kozelka, F. L.: A.M.A. Arch. of Path. 52: 455-457 (1951).
Peirce, E. M. See Geyer, R. P.
Pekich, A. M. See P'an, S. Y.
Penhos, J. C. See Rodriguez, R. R.
Pereira, F. B. See Da Cruz, A.
Perissinotto, B. and Lombardi, B.: Boll. Soc. ital. biol. sper. 28: 223-224 (1952a).
: Boll. Soc. ital. biol. sper. 28: 226-228 (1952b).
Perón, M. See Fabre, R.
Peters, J. H. See Ray, F. E.

Peterson, G. E. See Johansson, K. R.
Peterson, J. E. See Braden, A. W. H.
Petretti, A. K. See Newell, G. W.
Pezold, F. A. See Kessel, M.
Pfaff, R. See Woislawski, S.
Pfaltz, K. R. and Lacour, F.: Bull. Assoc. franç. étude cancer 39: 4-16 (1952).
Pfeiffer, C. A. and Allen, E.: Cancer Res. 8: 97-127 (1948).
Phatak, S. S. and Patwardhan, V. N.: J. Sc. & indust. Res. (India) 9B: No. 3, 70-76 (1950).
: J. Sc. & Indust. Res. (India) 11B: 173-176 (1952).
Philippot, E. See Dallemagne, M. J.; Gerebtzoff, M. A.
Philips, F. S. and Thiersch, J. B.: J. Pharmacol. & Exper. Therap. 95: 303-311 (1949).
Philips, F. S., Thiersch, J. B. and Bendich, A.: J. Pharmacol. & Exper. Therap. 104: 20-30 (1952).
Phillips, P. H. See Miller, R. F.
Piccagli, R. See Sulzberger, M. B.
Picco, A.: Tumori 35: 32-62 (1949).
Pick, R., Stamler, J., Rodbard, S. and Katz, L. N.: Circulation 6: 276-280 (1952).
Pick, R. See Robbard, S.; Stamler J.
Pierce, F. T.: Circulation 5: 401-407 (1952).
Pierce, F. T. and Gofman, J. W.: Circulation 4: 29-33 (1951).
Piette, M.: Ann. pharm. franç. 6: 207-210 (1948).
Pindborg, J. J.: J. Dent. Res. 31: 812-814 (1952).
Pinkston, L. A. See Hall, C. E.
Pirrie, R.: J. Path. & Bact. 64: 211-222 (1952).
Pizzo, A. See Hill, W. T.
Plaut, A. and Sobel, H.: Cancer Res. 9: 294-296 (1949).
Plum, C. M.: Arch. internat. pharmacodyn. 86: 52-79 (1951).
Plungian, M. B. See Wolfee, J. B.
Polettini, B.: Athena 16: 116-117 (1950).
Pollets, H. A. See P'an, S. Y.
Portugalov, B. V. See Andres, A. G.
Posselt, A. E. See Gross, L.
Pozzani, U. C. and Carpenter, C. P.: A.M.A. Arch. Indust. Hyg. 4: 465-468 (1951).
Pozzani, U. C., Weil, C. S. and Carpenter, C. P.: J. Indust. Hyg. & Toxicol. 31: 311-316 (1949).
Pozzani, U. C. See Carpenter, C. P.
Preacher, C. B. See Walton, R. P.
Preston, E., Hunt, A. D., Jr., Scott, T. F. M. and Spur, B.: J. Clin. Nutrition 1: 539-550 (1953).
Price, J. M. and Harman, J. W.: Cancer Res. 12: 288 (1952).
Price, J. M., Harman, J. W., Miller, E. C. and Miller, J. A.: Cancer Res. 12: 192-200 (1952).
Price, J. M., Miller, J. A. and Miller, E. C.: Cancer Res. 11: 523-528 (1951).
Price, J. M., Miller, J. A., Miller, E. C. and Weber, G. M.: Cancer Res. 9: 96-102 (1949).
Price, J. M. See Schweigert, B. S.
Prigozhina, E. L.: Arkh. Pat. 11: No. 3, 28-36 (1949).
: Arkh. Pat. 13: No. 2, 46-57 (1951).
Prina, C. and Tentoni, F.: Pathologica 41: 33-35 (1949).
Princi, F. and Geever, E. F.: A.M.A. Arch. Indust. Hyg. 1: 651-661 (1950).
Prior, J. T. and Ferguson, J. H.: Cancer 3: 1062-1072 (1950).
Pruzansky, S. See Glickman, I.
Pryor, J., Williams, G. Z. and Atkinson, J.: Cancer Res. 12: 289 (1952).
Puhr, L. See Graffi, A.
Pullinger, B. D.: Brit. J. Cancer 3: 494-501 (1949).
Pyrah, L. N. See Bonser, G. M.

Q

Quadbeck, G.: Klin. Wchnschr. 27: 449-452 (1949).
Quadbeck, G. See Kuhn, R.
Quagiliariello, F. and Ragno, I.: Boll. Soc. ital. biol. sper. 26: 1227-1230 (1950).
Quivy, D. See Bertrand, I.

R

Radike, A. W. and Muhler, J. C.: J. Dent. Res. 32: 807-810 (1953).
Radomski, J. L. and Davidow, B.: J. Pharmacol. & Exper. Therap. 107: 266-272 (1953).
Radomski, J. L., Fuyat, H. N., Nelson, A. A. and Smith, P. K.: J. Pharmacol. & Exper. Therap. 100: 429-444 (1950).
Radomski, J. L. See Hagan, E. C.
Ragno, I. See Quagliariello, E.
Raitio, A. See Roine, P.
Rakieten, N. See Hoekstra, J. B.
Rakoff, A. E., Gross, M. L. and Wellenbach, B. L.: J. Clin. Endocrinol. 2: 785-786 (1951).
Randall, L. O. and Lehmann, G.: J. Pharmacol. & Exper. Therap. 93: 314-328 (1948).
Rannie, I. and Duguid, J. B.: J. Path. & Bact. 66: 395-398 (1953).
Rapp, B. See Wyngaarden, J. B.
Rapuzzi, A. L. See Gardocki, J. F

Rask-Nielsen, R.: Acta path. et microbiol. scandinav. Suppl. 78: 1-144 (1948).
: Brit. J. Cancer 3: 549-556 (1949).
: Brit. J. Cancer 4: 108-116 (1950a).
: Brit. J. Cancer 4: 117-123 (1950b).
: Brit. J. Cancer 4: 124-132 (1950c).
Rask-Nielsen, R. and Gormsen, H.: Cancer 4: 387-397 (1951).
Rather, L. J. See Ambrose, A. M.
Rauschenbakh, M. O.: Arkh. Pat. 11: No. 3, 47-58 (1949).
Rawlinson, H. E. See Tuba, J.
Rawson, R. W. See Money, W. L.
Ray, F. E., Cambel, P., Jung, M. L., Peters, J. H. and Woislawski, S.: J. Nat. Cancer Inst. 13: 955-962 (1952).
Ray, F. E. See Cambel, P.
Ray, R. See Cook. D. L.
Read, G. and McGovern, V. J.: Australian J. Exper. Biol. Med. Sci. 31: 283-290 (1953).
Reeb, B. B. See Riegel, B.
Reilly, J. C. See P'an, S. Y.
Reiner, L. See Newell, G. W.
Reinertson, J. W. See Weston, J. K.
Reinhard, J. F. and Scudi, J. V.: Proc. Soc. Exper. Biol. & Med. 74: 190-191 (1950).
Reinhard, M. C. and Candee, C. F.: Am. J. Cancer 26: 552-553 (1936).
Reiter, A. See Druckrey, H.; Schmahl, D.
Rennels, E. G., Hess, M. and Finerty, J. C.: Proc. Soc. Exper. Biol. & Med. 82: 304-309 (1953).
Reutner, T. F. See Weston, J. K.
Reverdin, R. See Corre, L.
Rhein, A. See Griffin, A. C.
Richard, G. H. See P'an, S. Y.
Richards, R. K., Taylor, J. D., O'Brien, J. L. and Duescher, H. O.: J. Am. Pharm. A. (Scient. Ed.) 40: 1-6 (1951).
Richards, R. K. See Everett, G. M.
Richardson, H. L. and Borsos-Nachtnebel, E.: Cancer Res. 11: 398-403 (1951).
Richardson, H. L., Griffin, A. C. and Rinfret, A. P.: Cancer 6: 1025-1029 (1933).
Richardson, H. L., Stier, A. R. and Borsos-Nachtnebel, E.: Cancer Res. 12: 356-361 (1952).
Richardson, H. L. See Robertson, C. H.
Richert, D. A. See Westerfeld, W. W.
Richmond, M. T. See Vander Brook, M. J.
Rider, J. A., Ellinwood, L. E. and Coon, J. M.: Proc. Soc. Exper. Biol. & Med. 81: 455-459 (1952).
Ridout, J. H. See Best, C. H.
Riegel, B., Wartman, W. B., Hill, W. T., Reeb, B. B., Shubik, P. and Stanger, D. W.: Cancer Res. 11: 301-303 (1951).
Riegel, B. See Hill, W. T.
Riese, W. See Haag, H. B.
Rigdon, R. H.: A.M.A. Arch. Path. 54: 368-377 (1952).
Rinehart, J. F. See Greenberg, L. D.
Rinfret, A. P. See Griffin, A. C.; Richardson, H. L.
Ring, J. R. See Levy, B. M.
Ritchie, A. C.: J. Nat. Cancer Inst. 12: 839-846 (1951).
Ritchie, A. C. See Shubik, P.
Riviere, M. See Combescot, C.
Rivero-Fontan, J. L. See D'Angelo, S. A.
Robbard, S., Katz, L. N., Bolene, C., Pick, R., Lowenthal, M. and Gros, G.: Circulation 3: 867-874 (1951).
Robbins, A. N. See Geyer, R. P.
Robbins, D. J. See Ambrose, A. M.
Robbins, E. B. and Chen, K. K.: J. Am. Pharm. A. (Scient. Ed.) 40: 249-251 (1951).
Robbins, S. L. See Desforges, G.
Roberts, D. C. See Walpole, A. L.
Roberts, E. and Frankel, S.: Cancer Res. 9: 231-237 (1949a).
: Cancer Res. 9: 548 (1949b).
Robertson, A. See Paver, H.
Robertson, C. H., O'Neal, M. A., Griffin, A. C. and Richardson, H. L.: Cancer Res. 13: 776-779 (1953).
Robertson, C. H. (C.) See Griffin, A. C.
Robertson, E. See Kochakian, C. D.
Robertson, W. V. B., Dunihue, F. W. and Sanborn, E. C.: J. Clin. Endocrinol. 11: 784-785 (1951).
Robertson, W. V. B. and Kretchmer, N.: Cancer Res. 9: 564 (1949).
Robson, J. M. See Bonser, G. M.
Rodbard, S. See Pick, R.
Rodriguez, R. R.: Rev. Soc. argent. biol. 26: 205-210 (1950a).
: Rev. Soc. argent, biol. 26: 247-251 (1950b).
Rodriguez, R. R. and Martinez, C.: Rev. Soc. argent. biol. 26: 127-134 (1950).
Rodriguez, R. R. and Penhos, J. C.: Rev. Soc. argent. biol. 28: 148-151 (1952).
Roe, E. M. F. See Haddow, A.
Roe, F. J. C. See Salaman, M. H.
Roe, M. D. See Benson, W. M.
Rogers, C. S. See Jones, J. H.
Rogers, S.: J. Exper. Med. 93: 427-449 (1951).
Roholt, K. See Engelbreth-Holm, J.

Roine, P., Ettala, T. and Raitio, A.: Suomen Kemistilehti 26B, No. 2: 17-20 (1953).
Romero, E., Aquirre, C. and Gandarias, M.: Rev. clin espaň. 47: 98-105 (1952).
Root, R. E. See Stokinger, H. E.
Rose, C. S. See György, P.
Rose, F. L., Hendry, J. A. and Walpole, A. L.: Nature (London) 165: 993-996 (1950).
Rose, F. L. See Curd, F. H. S. Hendry, J. A.
Rosemary, W. Y. See Sellers, E. A.
Rosemberg, E. See Lewis, R. A.
Rosenbohm, A.: Ztschr. Krebsforsch. 56: 352-356 (1949a).
: Ztschr. Krebsforsch. 56: 357-362 (1949b).
Rosenfeld, I. See Barnes, B. F.
Rosenman, R. H. See Freed, S. C.
Rosenthal, T. B. See Lansing, A. I.
Ross, M. H. See Ely, J. O.
Ross, R. C., Scarf, R. F. and Skoryna, S. C.: A. M. A. Arch. Path. 55: 173-180 (1953).
Ross, R. C. See Skoryna, S. C.
Ross, W. F. See Hawking, F.
Rossi, L. See Cavallero, C.
Rosti, P. and Zangaglia, O.: Arch. sc. med. 96: 515-520 (1953).
Roth, J. L. See Dutra, F. R.
Rothenberg, M. S. See Stasney, J.
Rous, P. See Friedewald, W. F.; Smith W. E.
Roussy, G., Oberling, C. and Guérin, M.: Bull. Acad. med. 112: 809-816 (1934).
Rowe, V. K., McCollister, D. D., Spencer, H. C., Adams, E. M. and Irish, D. D.: A. M. A. Arch. Indust. Hyg. 5: 566-579 (1952a).
Rowe, V. K., Spencer, H. C. and Bass, S. L.: J. Indust. Hyg. & Toxicol. 30: 332-352 (1948).
Rowe, V. K., Spencer, H. C., McCollister, D. D., Hollingsworth, R. L. and Adams, E. M.: A. M. A. Arch. Indust. Hyg. 6: 158-173 (1952b).
Rowe, V. K. See Adams, E. M.; Hodge, H. C.; Spencer, H. C.
Rowinski, P. See DeMuro, P.
Royer, R. See Lacassagne, A.; Rudali, R.
Rozynek, W.: Ztschr. Krebsforsch. 57: 105-112 (1950).
Rubens-Duval, A. See Justin-Besancon, L.
Rubin, B. and Burke, J. C.: J. Pharmacol. & Exper. Therap. 107: 219-224 (1953).
Rubin, B., Hassert, G. L., Jr., Thomas, B. G. and Burke, J. C.: Am. Rev. Tuberc. (Supplement) 65: 392-401 (1952).
Rudali, G.: Compt. rend. Soc. biol. 146: 916-918 (1952).
Rudali, G., Buu-Hoi, N. P. and Lacassagne, A.: Compt. rend. Acad. sc. 236: 2020-2023 (1953).
Rudali, G., Buu-Hoi, N. P., Royer, R. and Ekert, B.: Compt. rend. Soc. biol. 146: 1504-1506 (1952).
Rudali, G. and Mariani, P. L.: Compt. rend. Soc. biol. 144: 1626-1627 (1950).
Rudali, G. and Royer, R.: Compt. rend. Soc. biol. 146: 1531-1533 (1952).
Rudali, G. See Dobrovolskaia, N.; Lacassagne, A.
Rudis, L. A. See Skoryna, S. C.
Ruedi, L., Furrer, W., Luthy, F., Nager, G. and Tschirren, B.: Laryngoscope 62: 333-351 (1952).
Rumsfeld, H. W., Jr., Clayton, C. C. and Baumann, C. A.: Cancer Res. 12: 671-676 (1952).
Rumsfeld, H. W., Jr., Miller, W. L., Jr. and Baumann, C. A.: Cancer Res. 11: 814-819 (1951).
Rusch, H. P. and Kline, B. E.: Proc. Soc. Exper. Biol. & Med. 69: 90-95 (1948).
: Cancer Res. 9: 545-546 (1949).
Rusch, H. P. See Boutwell, R. K.; MacDonald, J. C.; Miller, E. C.; Miller, J. A.
Russell, D. S. See Hoch-Ligeti, C.
Russell, H.: J. Path. & Bact. 59: 481-483 (1947).
Russell, W. O. and Loquvam, G. S.: Cancer Res. 9: 629 (1949).
: Cancer Res. 11: 962-964 (1951).
Russell, W. O. and Ortega, L. R.: Am. J. Path. 25: 824 (1949).
: A. M. A. Arch. Path. 53: 301-314 (1952).
Russell, W. O., Ortega, L. R. and Wynne, E. S.: Cancer Res. 12: 216-218 (1952).
Russo, S. See Marzullo, F.
Rutman, R. J. See Paschkis, K. E.

S

Sahyoun, P. F. See Smith, R. B., Jr.
Sakamoto, W. See Gordan, G. S.
Sala, G., Amira, A., Borasi, M. and Cavallero, C.: Lancet 260: 641-642 (1951).
Sala, G., Benati, O., Amira, A., Ciceri, C. and Cavallero, C.: Sperimentale 101: 195-208 (1951).
Salaman, M. H.: Brit. J. Cancer 6: 155-159 (1952).
Salaman, M. H. and Gwynn, R. H.: Acta Unio internat. contra cantrum 7: 152-155 (1950).
: Brit. J. Cancer 5: 252-263 (1951).
Salaman, M. H. and Roe, F. J. C.: Brit. J. Cancer 7: 472-481 (1953).
Salaman, M. H. See Gwynn, R. H.

Salgado, E.: Rev. canad. biol. 12: 451-453 (1953).
Salgado, E. and Selye, H.: Ann. endocrinol. (Paris) 14: 366-371 (1953).
Salmon, W. D. and Copeland, D. H.: Cancer Res. 9: 546 (1949a).
: J. Nat. Cancer Inst. 10: 361-365 (1949b).
Salva, J. A. See Garcia-Valdecasas, F.
Salzberg, D. A. and Griffin, A. C.: Cancer Res. 12: 294 (1952).
Sanborn, E. C. See Robertson, W. V. B.
Sandin, R. B., Melby, R., Hay, A. S., Jones, R. N., Miller, E. C. and Miller, J. A.: J. Am. Chem. Soc. 74: 5073-5075 (1952).
Sandin, R. B. See Miller, E. C.; Miller, J. A.
Sanfilippo, G.: Boll. Soc. ital. biol. sper. 24: 1065-1066 (1948).
: Boll. Soc. ital. biol. sper. 29: 1868-1869 (1953).
Sanghri, L. D. See Strong, L. C.
Sapp, R. W. See Miller, J. A.
Sargent, S. See Boyland, E.
Saslaw, I. M. See Geyer, R. P.
Sass, M. See Shils, M. E.
Saxén, E. A.: J. Nat. Cancer Inst. 13: 441-453 (1952).
: J. Nat. Cancer Inst. 14: 547-570 (1953).
Saxén, E. A., Ekwall, P. and Setälä, K.: Acta path. et microbiol. scandinav. 27: 270-275 (1950a).
: Acta path. et microbiol. scandinav. 27: 914-928 (1950b).
Saxén, E. A. See Malmgren, R. A.; Mulay, A. S.
Sayama, Y. See Kawai, K; Taki, T.
Scaduto, L. See P'an, S. Y.
Scarf, R. F. See Ross, R. C.
Schabad, L. M.: Arch sc. biol., Moscow, 51: No. 3, 112-119 (1938).
: Soviet Medicine 6: 1-5 (1949).
Schabad, L. M. See Martinova, R. P.
Shachter, R. J. See Ercoli, N.
Schaffer, C. B. See Carpenter, C. P.
Schär, M. See Schindler, O.
Schectman, A. M. See Hoffman, H. E.
Schindler, O., Schär, M. and Staehelin, D.: Pharm. Acta Helv. 23: 117-128 (1948).
Schinz, H. R., Fritz-Niggli, H., Campbell, T. W. and Schmid, H.: Oncologia 8: 233-245 (1955).
Schinz, H. R. and Steinman, H.: Oncologia 2: 185 (1949).
Schlesinger, A. See Blumberg, H.
Schlumberger, H. G.: J. Nat. Cancer Inst. 9: 111-118 (1948).
: Cancer Res. 12: 294 (1952).
Schmahl, D.: Arzneimittel-Forsch. 4: 405 (1954).
Schmahl, D. and Reiter, A.: Arzneimittel-Forsch. 3: 403-406 (1953).
: Arzneimittel-Forsch. 4: 404 (1954).
Schmahl, D. See Druckrey, H.
Schmid, H. See Schinz, H. R.
Schmid, R., Hanson, B. and Schwartz, S.: Proc. Soc. Exper. Biol. & Med. 79: 459-462 (1952).
Schmidt, H. W.: Ztschr. Krebsforsch. 56: 143-147 (1948).
Schmidt, I. G. See Schmidt, L. H.
Schmidt, L. H., Hoffmann, R. and Hughes, H. B.: Am. Rev. Tuberc. 67: 798-807 (1953a).
Schmidt, L. H., Hughes, H. B. and Schmidt, I. G.: J. Pharmacol. & Exper. Therap. 107: 92-130 (1953b).
Schneiderman, M. A. See Heston, W. E.
Schocke, H. See Lauber, H. J.
Schoental, R. See Cook, J. W.
Schourup, K. See Iversen, M.
Schuchardt, G. S. See McKinney, S. E.
Schultz, F. H., Jr. See Payne, H. G.
Schumann, H. J. See Langecker, H.
Schwartz, S. See Schmid, R.
Schweigert, B. S., Guthneck, B. T., Price, J. M., Miller, J. A. and Miller, E. C.: Proc. Soc. Exper. Biol. & Med. 72: 495-501 (1949).
Scott, C. C., Kroc, R. L. and Stasilli, N. R.: Endocrinology 50: 607-611 (1952).
Scott, J. K. See Hall, R. H.; Stokinger, H. E.
Scott, T. F. M. See Preston, E.
Scow, R. O.: Endocrinology 51: 42-51 (1952).
Scudi, J. V. See Reinhard, J. F.
Seelig, M. G. See Eckert, C. T.
Segaloff, A. See Dunning, W. F.
Selbie, F. R. and Thackray, A. C.: Brit. J. Cancer 2: 380-385 (1948).
Sellers, E. A. and Ferguson, J. K.: Endocrinology 45: 345-346 (1949).
Sellers, E. A., Hill, J. M. and Lee, R. B.: Endocrinology 52: 188-203 (1953).
Sellers, E. A., Lucas, C. C. and Best, C. H.: Brit. Med. J. 1: 1061-1064 (1948).
Sellers, E. A. and You, R. W.: J. Nutrition 44: 513-535 (1951).
Sellers, E. A., You, R. W. and Lucas, C. C.: Proc. Soc. Exper. Biol. & Med. 75: 118-121 (1950).
Sellers, E. A. See Ferguson, J. K. W.
Selye, H. See Salgado, E.
Setälä, K.: Ann. med. exper. et biol. Fenniae 26: 126-129 (1948).

: Acta path. et microbiol. scandinav. 26: 280-295 (1949a).
: Acta path. et microbiol. scandinav. 26: 682-693 (1949b).
Setälä, K. and Ekwall, P.: Acta path. et microbiol. scandinav. 26: 804-808 (1949).
: Ann. med. exper. et biol. Fenniae 28: 110-124 (1950).
Setälä, K. See Ekwall, P.; Saxen, E.
Setsuda, T., Yokoyama, T., Oga, T., Hirata, T., Yamato, M., Mizukawa, I., Uba, B., Nishikawa, M., Yoshimoti, T. and Kamada, H.: Folia pharmacol. japon. 45: No. 3, 100-105 (1950).
Setter, V. See Griffin, A. C.
Sforzini, P.: Biol. Latina 2: 267-271 (1949).
Shabad, L. M. See Schabad, L. M.
Shapero, M. See Goldberg, A. A.
Shapiro, E. See Kensler, C. J.
Shapiro, J. R. and Kirschbaum, A.: Cancer Res. 11: 644-647 (1951).
Shapiro, J. R. See Kirschbaum, A.
Shay, H., Aegerter, E. A., Gruenstein, M. and Komarov, S. A.: Fed. Proc. 8: 145 (1949a).
: J. Nat. Cancer Inst. 10: 255-266 (1949b).
Shay, H., Gruenstein, M., Harris, C. and Glazer, L.: Cancer Res. 11: 278 (1951a).
Shay, H., Gruenstein, M., Marx, H. E. and Glazer, L.: Cancer Res. 11: 29-34 (1951b).
Shay, H., Gruenstein, M. and Weinberger, M.: Cancer Res. 12: 296 (1952a).
Shay, H., Harris, C. and Gruenstein, M.: Cancer 4: 988-993 (1951c).
: J. Nat. Cancer Inst. 13: 307-331 (1952b).
Sheldon, P. See Denton, R. W.
Sherman, H. See Harris R. S.
Shils, M. E. and Goldwater, L. J.: J. Nutrition 41: 293-305 (1950).
: A. M. A. Arch. Indust. Hyg. 8: 262-267 (1953).
Shils, M. E., Sass, M., Wolke, M., Marks, G., Goldwater, L. and Berg. A.: Brit. J. Indust. Med. 8: 284-287 (1951).
Shimkin, M. B. and McClelland, J. M.: J. Nat. Cancer Inst. 10: 597-603 (1949).
Shimojo, K. See Mori, K.
Shockman, G. D. See Forbes, M.
Shoppee, C. W. See Gough, N.
Shubik, P.: Cancer Res. 10: 13-17 (1950a).
: Cancer Res. 10: 713-717 (1950b).
Shubik, P., Baserga, R. and Ritchie, A. C.: Brit. J. Cancer 7: 342-351 (1953).
Shubik, P. and Ritchie, A. C.: Cancer Res. 13: 343-346 (1953).
Shubik, P. See Berenblum, I.; Hill, W. T.; Riegel, B.
Siegel, A. N. See D'Angelo, S. A.
Sigmon, H. E. See Treon, J. F.
Silber, E. N. See Stamler, J.
Silber, R. H. See Winter, C. A.
Silberberg, M. and Silberberg, R.: A. M. A. Arch. Path. 32: 85-95 (1941b).
: Proc. Soc. Exper. Biol. & Med. 69: 438-441 (1948).
: A. M. A. Arch. Path. 47: 340-349 (1949).
: Cancer Res. 11: 279-280 (1951).
Silberberg, M. See Silberberg, R.
Silberberg, R. and Silberberg, M.: Cancer Res. 10: 718-725 (1950).
Silberberg, R. See Silberberg, M.
Silverstone, H.: Cancer Res. 8: 301-308 (1948a).
: Cancer Res. 8: 309-317 (1948b).
Silverstone, H., Solomon, R. D. and Tannenbaum, A.: Cancer Res. 12: 750-756 (1952).
Silverstone, H. and Tannenbaum, A.: Cancer Res. 9: 684-688 (1949).
Silverstone, H. See Tannenbaum, A.
Simon, M. A. See Wener, J.
Simpson, C. L.: Brit. J. Exper. Path. 33: 524-528 (1952).
Simpson, M. E. See Moon, H. D.
Sinclair, J. G.: Texas Rep. Biol. & Med. 7: 456-461 (1949).
Sinclair, J. W. See Ball W. L.
Siperstein, M. D., Nichols, C. N. and Chaifoff, I. L.: Circulation 7: 37-41 (1953a).
: Science 117: 386-389 (1953b).
Sissons, H. A.: Acta Unio internat. contra cancrum 7: 171-172 (1950a).
: Ann. Roy. Coll. Surgeons England 7: 34-37 (1950b).
Sissons, H. A. See Barnes, J. M.
Skoryna, S. C., Ross, R. C., Rudis, L. A. and Webster, D. R.: Cancer Res. 11: 280 (1951).
: J. Exper. Med. 94: 1-7 (1951).
Skoryna, S. C., Rudis, L. A. and Webster, D. R.: Cancer Res. 11: 280-281 (1951).
Skoryna, S. C. and Webster, D. R.: Proc. Soc. Exper. Biol. & Med. 78: 62-67 (1951).
: Surgical Forum--Clin. Congr. Am. Coll. Surg., Proc. 36th Clin. Congr. 205 (1950).
Skoryna, S. C. and Webster, D. R.: Proc. Am. A. Cancer Res. 1: 52 (1953).
Skoryna, S. C. See Ross, R. C.
Slanetz, C. A. See Atkinson, W. B.
Small, C. S., Bryant, E. F. and Palmer, G. H.: A. M. A. Arch. Surg. 60: 575-582 (1950).

Smith, A. G. See Nettleship, A.
Smith, A. H. See Orten, J. M.
Smith, C. C.: A. M. A. Arch. Indust. Hyg. 7: 310-318 (1953).
Smith, F. A. See Stokinger, H. E.
Smith, F. H., Jr. See Harned, B. K.
Smith, H. W. See Graeff, I.
Smith, J. A. and Zalman, S.: Proc. Soc. Exper. Biol. & Med. 72: 13-15 (1949).
Smith, J. M. See Mirick, G. S.
Smith, M. I. See Stohlman, E. F.
Smith, P. K. See Radomski, J. L.
Smith, R. B., Jr., Finnegan, J. K., Larson, P. S., Sahyoun, P. F., Dreyfuss, M. L. and Haag, H. B.: J. Pharmacol. & Exper. Therap. 109: 159-166 (1953).
Smith, W. E.: Cancer Res. 9: 712-723 (1949).
: J. Exper. Med. 91: 87-104 (1950).
Smith, W. E. and Rouse, P.: J. Exper. Med. 88: 529-554 (1948).
: Cancer Res. 9: 544-545 (1949).
Smyth, H. F., Jr., Carpenter, C. P. and Weil, C. S.: J. Am. Pharm. A. (Scient. Ed.) 39: 349-354 (1950).
Smyth, H. F., Jr. See Carpenter, C. P.; Weil, C. S.
Snipes, A. E. See Buckley, J. J.
Sobel, H. See Plaut, A.
Solomon, R. D. See Silverstone, H.
Sorof, S., Cohen, P. P., Miller, E. C. and Miller, J. A.: Cancer Res. 11: 383-387 (1951).
Spampinato, V.: Boll. Soc. ital. biol. sper. 26: 173-175 (1950a).
: Boll. Soc. ital. biol. sper. 26: 1364-1366 (1950b).
Spence, I. See Gillman, J.
Spencer, E. Y. See Altschul, R.
Spencer, H. C., Rowe, V. K., Adams, E. M. and Irish, D. D.: J. Indust. Hyg. & Toxicol. 30: 10-25 (1948).
: A. M. A. Arch. Indust. Hyg. 1: 341-347 (1950a).
Spencer, H. C., Rowe, V. K., Adams, E. M., McCollister, D. D. and Irish, D. D.: A. M. A. Arch. Indust. Hyg. 4: 482-493 (1951).
Spencer, H. C., Rowe, V. K., and McCollister, D. D.: J. Pharmacol. & Exper. Therap. 99: 57-68 (1950b).
Spencer, H. C. See Adams, E. M.; Hodge, H. C.; Rowe, V. K.
Spencer, J. N. See Payne, H. G.
Spiegl, C. J.: National Nuclear Energy Service, Div. VI, Vol. 1, Book 3: 2291-2321 (1953).
Spiegl, C. J. See Stokinger, H. E.
Spinks, A. See Francis, J.
Spitz, S., Maguigan, W. H. and Dobriner, K.: Cancer 3: 789-804 (1950).
Spooner, M. See Steinberg, B.
Sprague, G. F. See Stokinger, H. E.
Spur, B. See Preston, E.
Staehelin, D. See Schindler, O.
Stamler, J., Bolene, C., Harris, R. and Katz, L. N.: Circulation 2: 712-721 (1950a).
: Circulation 2: 722-725 (1950b).
Stamler, J. and Katz, L. N.: Circulation 2: 705-713 (1950).
Stamler, J., Miller, A. J., Akman, L., Silber, E. N., Bolene, C. and Katz, L. N.: Circulation 2: 523-529 (1950c)
Stamler, J., Pick, R. and Katz, L. N.: Circulation 1: 94-98 (1953).
Stamler, J., Silber, E. N., Miller, A. J., Akman, L., Bolene, C. and Katz, L. N.: J. Lab. & Clin. Med. 35: 351-361 (1950d).
Stamler, J. See Pick, R.
Stampfl, B. See Herz, A.
Stanbury, J. B. See Wyngaarden, J. B.
Stansfield, R. See Williams, J. L.
Stare, F. J. See Geyer, R. P.
Stasilli, N. R. See Scott, C. C.
Stasney, J., Paschkis, K. E. and Cantarow, A.: Cancer Res. 9: 565-566 (1949).
: Cancer Res. 10: 283-288 (1950).
Stasney, J., Paschkis, K. E., Cantarow, A. and Rothenberg, M. S.: Cancer Res. 7: 356-362 (1947).
Stasney, J. See Cantarow, A.; Paschkis, K. E.
Steadman, L. T. See Stokinger, H. E.
Stefko, P. L. See Benson, W. M.
Steinberg, B. and Spooner, M.: Fed. Proc. 10: 371 (1951).
Steinberg, B. See Dietz, A. A.
Steiner, A., Davidson, J. D. and Kendall, F. E.: Am. Heart J. 36: 477 (1948).
Steiner, A., Kendall, F. E. and Bevans, M.: Am. Heart J. 38: 34-42 (1949).
Steiner, P. E. and Edgecomb, J. H.: Cancer Res. 12: 657-659 (1952).
Steiner, P. E. and Falk, H. L.: Cancer Res. 11: 56-63 (1951).
Steinman, H. See Schinz, H. R.
Stephenson, M. L. See Zamecnik, P. C.
Stern, K.: Cancer Res. 10: 243 (1950a).
: Cancer Res. 10: 565-570 (1950b).
Sterner, J. H. See Hodge, H. C.
Stettner, C. E. See Kochakian, C. D.
Stevens, D. F. See Lutz, B. R.
Stevenson, J. W. and Ellis, N. R.: J. Appl. Physiol. 5: 549-554 (1953).
Steward, G. T. See Francis, J.
Stewart, H. L. and Hare, W. V.: Acta Unio internat. contra cancrum 7: 176-177 (1950).

Stewart, H. L., Hare, W. V. and Bennett, J. G.: J. Nat. Cancer Inst. 14: 105-126 (1953).
Stewart, H. L., Hare, W. V., Lorenz, E. and Bennett, J. G.: Cancer Res. 9: 618-619 (1949a).
: J. Nat. Cancer Inst. 10: 359-360 (1949b).
Stewart, H. L. See Burgoyne, H. L.; Firminger, H. I.; Hare, W. V.; Lorenz, E.
Stiefel, J. R. See Alfredson, B. V.
Stier, A. R. See Richardson, H. L.
Stoerk, H. C. See Winter, C. A.
Stohlman, E. F. and Lillie, R. B.: J. Pharmacol. & Exper. Therap. 93: 351-361 (1948).
Stohlman, E. F., Thorp, W. T. S. and Smith, M. I.: A.M.A. Arch. Indust. Hyg. 1: 13-19 (1950).
Stokey, E. H. See Cunningham, R. W.
Stokinger, H. E., Ashenburg, N. J., DeVoldre, J., Scott, J. K. and Smith, F. A.: A. M. A. Arch. Indust. Hyg. 1: 398-410 (1950b).
Stokinger, H. E., Spiegl, C. J., Root, R. E., Hall, R. H., Steadman, L. T., Stroud, C. A., Scott, J. K., Smith, F. A. and Gardner, D. E.: A. M. A. Arch. Indust. Hyg. 8: 493-506 (1953).
Stokinger, H. E., Sprague, G. F., Hall, R. H., Ashenburg, N. J., Scott, J. K. and Steadman, L. T.: A. M. A. Arch. Indust. Hyg. 1: 379-397 (1950a).
Stokinger, H. E., Stroud, C. A. and Root, R. E.: J. Lab. & Clin. Med. 38: 173-182 (1951).
Stokinger, H. E. See Hall, R. H.; Mountain, J. T.
Stolarsky, F. See Haley, T. J.
Stone, C. H. See Jones, J. H.
Stout, A. P. See Oppenheimer, B. S.
Stowell, R. E.: Cancer 4: 121-131 (1949).
Stowell, R. E., Lee, C. S., Tsuboi, K. K. and Villasana, A.: Cancer Res. 11: 345-354 (1951).
Stowell, R. E. See Lee, C. S.
Strait, L. A. See De Ome, K. B.
Stranger, D. W. See Hill, W. T.; Riegel, B.
Striebich, M. J. See Dalton, A. J.
Stroller, E. R. See Fishberg, A. M.
Strömbeck, J. P. and Ekman, B.: Acta path. et microbiol. scandinav. 26: 480-495 (1949).
Strömbeck, J. P. See Ekman, B.
Strong, J. S. See Kincaid, J. F.
Strong, L. C.: Brit. J. Cancer 4: 315-320 (1950a).
: Science, 111: 381-382 (1940b).
: Yale J. Biol. & Med. 22: 303-307 (1950c).
: Cancer Res. 11: 42-45 (1951a).
: Cancer Res. 11: 284 (1951b).
: Cancer Res. 12: 508-509 (1952).
Strong, L. C. and Sanghri, L. D.: Ztschr. Krebsforsch. 58: 1-27 (1951).
Strong, L. C. See Bagshaw, M. A.; Hollander, W. F.
Stroud, C. A. See Hall, R. H.; Stokinger, H. E.
Sturkie, P. D. and Newman, H. J.: Endocrinology 49: 565-570 (1951).
Sturm, E. See Murphy, J. B.
Sugar, J. and Kellner, B.: Acta morphol. Hung. 3: 233-253 (1953).
Sugiura, K.: Cancer Res. 7: 732 (1947).
: Cancer Res. 8: 141-144 (1948).
Sugiura, K., Kensler, C. and Crossley, M. L.: Proc. Am. A. Cancer Res. 1: 55 (1953).
Sulzberger, M. B., Hermann, F., Piccagli, R. and Frank, L.: Proc. Soc. Exper. Biol. & Med. 82: 673-675 (1953).
Sunderman, F. W. See Kincaid, J. F.
Sweeney, K. M. and Oster, K. A.: J. Am. Pharm. A. (Scient. Ed.) 42: 556-560 (1953).
Sweets, H. H., Jr. See Neal, M. P.
Swick, R. W. and Bauman, C. A.: Cancer Res. 11: 948-953 (1951).
Sylvén, B. and Larson, L. G.: Cancer Res. 8: 449-463 (1948).
Symeonidis, A.: Acta Unio internat. contra cancrum 6: 163-166 (1948).
Symeonidis, A., Mulay, A. S. and Burgoyne, F. H. Cancer Res. 11: 285 (1951).
Szebehely, J. See Fabinyi-Szebehely, M.
Szontagh, F. See Lichner, G.

T

Tachibana, K.: Nagoya J. Med. Sc. 15: 108-112 (1952).
Takada, I.: Nagoya J. Med. Sc. 15: 195-200 (1952).
Takewaki, K.: Annotationes Zool. japon. 25: 113-119 (1952).
Taki, I.: Med. J. Osaka Univ. 2: No. 4, 57-65 (1951).
Taki, I., Kawai, K., Uemura, F., Kitamura, H. and Sayama, Y.: Gann 43: 116-118 (1952).
Taki, I. See Kawai, K.
Tannenbaum, A. and Silverstone, H.: Cancer Res. 7: 567-574 (1947).
: Cancer Res. 9: 162-173 (1949a).
: Cancer Res. 9: 403-410 (1949b).
: Cancer Res. 9: 724-727 (1949c).
: Cancer Res. 13: 460-463 (1953).
Tannenbaum, A. See Silverstone, H.
Tappi, G. See Forni, P. V.
Tatum, E. L. See Griffin, A. C.
Tauber, O. E. and Hughes, A. B.: Proc. Soc. Exper. Biol. & Med. 75: 420-422 (1950).
Tawab, S. A. A., Carr, C. J. and Frantz, J. C., Jr.: J. Pharmacol. & Exper. Therap. 96: 416-421 (1949).

Taylor, B. C. See Kelly, F. B.
Taylor, E. S., Pallas, W. C., Wikle, W. T., McCallin, P. F. and Goodman, S. N.: Cancer Res. 10: 360-361 (1950).
Taylor, J. D. See Richards, R. K.
Tedeschi, C. G.: A. M. A. Arch. Path, 47: 160-174 (1949).
Telford, I. R.: Ann. New York Acad. Sc. 52: 132-134 (1949).
Telò, W.: Gior. clin. med. 30: 275-295 (1949).
Tentoni, F. See Prina, C.
Thackray, A. C. See Selbie, F. R.
Thamsen, A.: Acta path. et microbiol. scandinav. 32: 137-146 (1953).
Thiersch, J. B. See Philips, F. S.
Thiery, J. P. See Thomas, J. A.
Thomas, B. G. See Rubin, B.
Thomas, J. A. and Thiery, J. P.: Compt. rend. Soc. biol. 236: 1387-1389 (1953).
Thomas, J. F. See Hodge, H. C.
Thomas, J. R. See Handley, C. A.
Thompson, C. R. and Werner, H. W. J. Am. Pharm. A. (Scient. Ed.) 37: 311-314 (1948).
: Proc. Soc. Exper. Biol. & Med. 77: 494-497 (1951).
Thompson, C. R. See Brown, B. B.
Thompson, P. E. See Weston, J. K.
Thorp, F. See Alfredson, B. V.
Thorp, W. T. S. See Stohlman, E. F.
Thuillier, J. See Chabrier, T.
Tiedemann, H.: Ztschr. Naturforsch. 8b: 49-50 (1953).
Tifft, M. O. See Griffin, A. C.
Tillotson, I. T. See Caskey, W. H.
Timmens, E. K. See Gardocki, J. F.
Tinacci, F. and Ignesti, G.: Sperimentale 101: 100-117 (1951).
Tisch, D. E. See Hoekstra, J. B.
Tischendorf, W. and Fritze, E.: Klin. Wchnschr. 26: 179-182 (1948).
Toovey, E. W. See Kobernick, S. D.
Tornaben, J. A. See Light, A. E.
Trabin, B. See Harrison, J. W. E.
Traina, V.: A. M. A. Arch. Path. 59: 278-279 (1950).
Trapold, J. H., Warren, M. E. and Woodbury, R. A.: J. Pharmacol. & Exper. Therap. 100: 119-127 (1950).
Trentin, J. J.: Proc. Soc. Exper. Biol. & Med. 75: 267-269 (1950).
Treon, J. F., Deichmann, W. B., Sigmon, H. E., Wright, H., Witherup, S. O., Heyroth, F. F., Kitzmiller, K. V. and Keenan, C.: A. M. A. J. Indust. Hyg. 31: 1-20 (1949a).
Treon, J. F. and Dutra, F. R.: A. M. A. Arch. Indust. Hyg. 5: 52-61 (1952).
Treon, J. F., Dutra, F. M. and Cleveland, F. P.: A. M. A. Arch. Indust. Hyg. 8: 170-184 (1953).
Treon, J. F., Kitzmiller, K. V., Sigmon, H., Dutra, F. and Younker, W. J.: J. Indust. Hyg. & Toxicol. 31: 235-250 (1949b).
Treon, J. F., Sigmon, H. E., Wright, H., Heyroth, F. F. and Kitzmiller, K. V.: A. M. A. Arch. Indust. Hyg. 1: 506-524 (1950).
Treon, J. F., Sigmon, H., Wright, H. and Kitzmiller, K. V.: J. Pharmacol. & Exper. Therap. 31: 317-326 (1949c).
Treon, J. F., Wright, H., Kitzmiller, K. V. and Younker, W. J.: J. Indust. Hyg. & Toxicol. 30: 79-91 (1948).
Troitskaya-Andreeva, A. M.: Arkh. Pat. 10: No. 5, 23-26 (1948).
Truhaut, R.: Ann. pharm. franc. 5: 619-623 (1947a).
: Compt. rend. Acad. Sc. 225: 544-546 (1947b).
Truhaut, R. and Vermes, E.: Compt. rend. Soc. biol. 143: 1542-1543 (1949).
Truhaut, R. See Fabre, R.
Tschirren, B. See Ruedi, L.
Tsuboi, K. K. See Stowell, R. E.
Tuba, J., Rawlinson, H. E., Fraser, M. S. and Jeske, I.: Canad. J. M. Sc. 31: 95-98 (1953).
Tubiana, M. See Clement, G.
Tuchmann-Duplessis, H. and Levasseur, C.: Bull. microscop. appl. 3: 9-11 (1953).
Tuchmann-Duplessis, H. and Mercier-Parot, L.: Compt. rend. Soc. biol. 146: 919-921 (1952).
Tucker, R. G. See Meneely, G. R.
Tung, T. C. and Cohen, P. P.: Cancer Res. 10: 793-796 (1950).
Tusing, T. W. See Hazleton, L. W.

U

Uba, B. See Setsuda, T.
Uemura, F. See Kawai, K.; Taki, I.
Ulsperger, E. See Graffi, A.
Umeda, M.: Gann 43: 120-122 (1952).
Ungar, H.: Am. J. Path. 27: 871-884 (1951).
Upton, A. C. and Zarafonetis, C. J.: Proc. Soc. Exper. Biol. & Med. 75: 405-452 (1950).

V

Vallerini, G. See Caltabiano, S.
Van Bekkum, D. W. and Kassenaar, A. A. H.: Acta endocrinol. 8: 155-164 (1951).

Vander Brook, M. J., Olson, K. J., Richmond, M. T. and Kuizenga, M. H.: J. Pharmacol. & Exper. Therap. 94: 197-208 (1948).
Vanderhaeghe, H.: Arch. internat. pharmacodyn. 81: 500-506 (1950).
van der Schueren, G.: Verhandel. Koninkl. Vlaam. Acad. Geneesk. Belg. 3: 80-91 (1941).
van der Schueren, G. and Debie, F.: Acta Unio internat. contra cancrum 7: 178-183 (1950).
Van Dyke, J. H.: A. M. A. Arch. Path. 56: 613-628 (1953).
van Proosdij-Hartzema, E. G. See de Jongh, D. K.
van Sluis, K. J. H.: Food Manufacture 26: 99-101 (1951).
van Wagenen, G.: Endocrinology 45: 544-546 (1949).
Varga, G. See Balo, J.
Vargas, L., Jr. See Lipschütz, A.
Varveri, A.: Boll. Soc. ital. biol. sper. 24: 239-241 (1948).
Vazquez-Lopez, E.: Brit. J. Cancer 3: 401-414 (1949).
Vermes, E. See Truhaut, R.
Verniory, A.: Arch. internat. pharmacodyn. 85: 451-461 (1951).
Vesce, C. A.: Folia med. (Naples) 31: 415-426 (1948).
: Abstracts World Med. 6: 20-21 (1949).
Vessey, R. E. See Cunningham, R. W.; Harned, B. K.
Vidal-Sivilla, S. See Monche, J.
Villani, G. and Cazzoroli, L.: Rass. med. 28: 117-119 (1951).
Villasana, A. See Stowell, R. E.
Villiaumey, J. See Justin-Besancon, L.
Villisana, A. See Lee, C. S.
Vining, D. See Cloudman, A. M.
Violante, F.: Boll. Soc. ital. biol. sper. 24: 497-499 (1948).
Visscher, M. B. See King, J. T.
Voitkevich, A. A.: Fiziol. Zhur. 33: 791-803 (1947).
: Doklady Akad. Nauk. S. S. S. R. 61: 1113-1116 (1948).
von Euler, B., von Euler, H. and Lindeman, G.: Ark. Kemi. Mineral. Geol. 26B: No. 3, 5 (1948).
von Euler, H. See von Euler, B.
von Hamm, E. See Malletti, F. S.
von Oettingen, W. F., Donahue, D. D., Yagoda, H., Monaco, A. R. and Harris, M. R.: J. Indust. Hyg. & Toxicol. 31: 21-31 (1949).
Voss, E. See Crampton, J. M.; Johnson, H. D.
Vulterini, S. See Marfori, L.

W

Wade, E. M. See Mirone, L.
Wainio, W. W. See Allison, J. B.
Walkov, M. B. See Wolfee, J. B.
Walpole, A. L., Williams, H. C. and Roberts, D. C.: Brit. J. Indust. Med. 9: 255-263 (1952).
Walpole, A. L. See Hendry, J. A.; Rose, F. L.
Walton, R. P., Preacher, C. B. and Cannon, W. M.: J. Pharmacol. & Exper. Therap. 92: 214-225 (1948).
Wang, C. Y. and Nickerson, M.: Proc. Soc. Exper. Biol. & Med. 70: 92-96 (1949).
Wanscher, O.: Acta path. et microbiol. scandinav. 32: 348-352 (1953).
Ward, D. N., Brandt, E. L. and Griffin, A. C.: Cancer 5: 625-630 (1952).
Warren, M. R. See Trapold, J. H.
Warshawsky, H. See Abramson, W.
Wartman, W. B. See Hill, W. T.; Riegel, B.
Wase, A. W. and Allison, J. B.: Proc. Soc. Exper. Biol. & Med. 73: 147-148 (1950).
Wase, A. W. See Allison, J. B.
Watson, G. M. and Witts, L. J.: J. Path. & Bact. 64: 232-234 (1952).
Weatherall, M. and Comfort, A.: Nature 169: 587-588 (1952).
Weatherall, M. See Pardoe, A. U.
Weatherby, J. H.: Proc. Soc. Exper. Biol. & Med. 81: 300-301 (1952).
Weber, G. M. See Price, J. M.
Webster, D. R. See Kobernick, S. D.; Skoryna, S. C.
Wegener, H.: Naunyn-Schmiedebergs Arch. exper. Pathol. u. Pharmakol. 220: 414-417 (1953).
Weil, C. S., Smyth, H. F., Jr. and Nale, T. W.: A. M. A. Arch. Indust. Hyg. 5: 535-547 (1952).
Weil, C. S. See Carpenter, C. P.; Pozzani, U. C.; Smyth, H. F., Jr.
Weinberger, M. See Shay, H.
Weinmann, J. P. See Banks, S. O.
Weintrab, S. See Kraus, S. D.
Weisburger, E. K. See Weisburger, J. H.
Weisburger, J. H., Weisburger, E. K. and Morris, H. P.: J. Am. Chem. Soc. 74: 4540-4543 (1952).
Weiss, S. B., Marx, L. and Marx, W.: Endocrinology 50: 192-198 (1952).
Welbourn, R. B. and Code, C. F.: Gastroenterology 23: 356-362 (1953).
Wellenbach, B. L. See Rakoff, A. E.
Wells, L. J. See Harsh, R.
Wener, J., Hoff, H. E., and Simon, M. A.: Gastroenterology 11: 904-922 (1948).
: Gastroenterology 12: 637-647 (1949).
Wenzel, D. G. and Gibson, R. D.: J. Pharm. & Pharmacol. 3: 169-176 (1951).

Werner, H. W. See Brown, B. B.; Thompson, C. R.
Westerfeld, W. W., Richert, D. A. and Hilfinger, M. F.: Cancer Res. 10: 486-494 (1950).
Westfall, B. B. See Morris, H. P.
Weston, J. K., Thompson, P. E., Reinertson, J. W., Fisken, R. A. and Reutner, T. F.: J. Pharmacol. & Exper. Therap. 107: 315-324 (1953).
Whitaker, W. L. See Baker, B. L.
White, F. R. See White, J.
White, J. and Hein, R. R.: Cancer Res. 10: 248-249 (1950).
: J. Nat. Cancer Inst. 12: 23-26 (1951).
White, J., Hein, R. R. and White, F. R.: Cancer Res. 10: 249 (1950).
White, J. and Mori-Chavez, P.: J. Nat. Cancer Inst. 12: 777-787 (1951).
White, J. See Fones, W. S.
White, P. L. See Kaufman, N.
Whitehead, R. W. See Hidalgo, J.
Whiteley, H. J. and Ghadially, F. N.: Brit. J. Cancer 5: 353-357 (1951).
Whitesell, M. F. See Draize, J. H.
Wikle, W. T. See Taylor, E. S.
Wilder, E. See Goldberg, A. A.
Wilhelmi, G. and Domenjoz, R.: Arch. internat. pharmacodyn. 86: 321-334 (1951).
Willheim, R. and Ivy, A. C.: Gastroenterology 23: 1-19 (1953).
Williams, A. W.: Brit. J. Exper. Path. 34: 621-624 (1953).
Williams, G. Z., Young, N. F. and Moore, J. P.: Cancer Res. 11: 289 (1951).
Williams, G. Z. See Pryor, J.
Williams, H. C. See Walpole, A. L.
Williams, J. L. and Stansfield, R.: Nature 164: 272 (1949).
Williams, S. C. See Keith, J. F., Jr.
Wilson, J. E. See Paver, H.
Wilson, J. W., Leduc, E. H. and Corner, J. A.: Cancer Res. 10: 249 (1950).
Wilson, R. H. and DeEds, F.: A. M. A. Arch. Indust. Hyg. 1: 73-80 (1950).
Wilt, W. G., Jr. See Hodge, H. C.
Winter, C. A., Silber, R. H. and Stoerk, H. C.: Endocrinology 47: 60-72 (1950).
Wintrobe, M. M. See Palmer, J. G.
Wirth, P. See Danowski, T. S.
Witherup, S. O. (S.) See Deichmann, W. B.; Treon, J. F.
Witts, L. J. See Watson, G. M.
Woelkel, O. See Lindner, A.
Woislawski, S., Maynard, E. A., Pfaff, R., Roynton, L. C. and Hodge, H. C.: J. Am. Pharm. A. (Scient. Ed.) 42: 468-470 (1953).
Woislawski, S. See Ray, F. E.
Wolfe, G. F. See Figge, F. H.
Wolfee, J. B., Hyman, A. S., Plungian, M. B., Dale, A. C., McGinnis, G. E. and Walkov, M. B.: J. Gerontology 7: 13-23 (1952).
Wolke, M. See Shils, M. E.
Womack, N. A. See Hickey, R. C.; Osborn, M.
Woodard, G. See Draize, J. H.; Nelson, A. A.
Woodbine, M. See Brownlee, G.
Woodbury, R. A. See Trapold, J. H.
Woodhouse, D. L. See Billingham, R. E.
Woodward, G. E.: Cancer Res. 11: 918-921 (1951).
Wright, H. See Treon, J. F.
Wright, L. T. See Kraus, S. D.
Wrigley, F. See Parkes, M. M.
Wyngaarden, J. B., Stanbury, J. B. and Rapp, B.: Endocrinology 52: 568-574 (1953).
Wynne, E. S. See Russell, W. O.

X

Xuong, N. D. See Lacassagne, A.

Y

Yagoda, H. See von Oettingen, W. F.
Yamada, Y. See Ogino, S.
Yamasaki, K. See Miyamoto, Y.
Yamato, M. See Mizukawa, I.
Yokoyama, T. See Setsuda, T.
Yoshida, T.: Gann 28: 454-457 (1934b).
Yoshimoti, T. See Setsuda, T.
Yoshiya, M.: Igaku to Seibutsugaku (Med. and Biol.) 24: 44-47 (1952).
You, R. W. See Sellers, E. A.
Young, N. F. See Williams, G. Z.
Young, W. C. See Brown, M. M.
Younker, W. J. See Treon, J. F.
Yuda, N. N. See Cunningham, R. W.; Harned, B. K.

Z

Zabransky, F. W. See Harned, B. K.
Zaimis, E. See Paton, W. D.
Zajdela, F. and Buu-Hoi, N. P.: Acta Unio internat. contra cancrum 7: 184-189 (1950a).
: 5th Internat. Cancer Cong. (Paris) 50 (1950b).
Zajdela, F. See Lacassagne, A.
Zalman, D. See Smith, J. A.

Zambrano, A.: Folia med. (Naples) 33: 553-555 (1950).
: Folia med. (Naples) 34: 424-431 (1951).
Zamecnik, P. C. and Stephenson, M. L.: Cancer Res. 7: 326-332 (1947).
Zamurovitch, D. A.: Oncologia 6: 190-194 (1953).
Zanaboni, A. See Ghiringhelli, C.
Zangaglia, O. See Rosti, P.
Zarafonetis, C. J. See Upton, A. C.
Zarrow, I. G. See Zarrow, M. X.
Zarrow, M. X. and Zarrow, I. G.: Proc. Soc. Exper. Biol. & Med. 76: 620-623 (1951).
Zavarzina, N. B. See Meisel, M. N.
Zizine, L. A.: Compt. rend. Soc. biol. 144: 1666-1667 (1950).
Zupko, A. G. and Edwards, L. D.: J. Am. Pharm. A. (Scient. Ed.) 38: 124-131 (1949).
Zylberszac, S.: Compt. rend. Soc. biol. 145: 136-138 (1951).

CUMULATIVE COMPOUND INDEX

Numbers refer to compound numbers

Numbers preceded by O appear in the original "Survey", 2nd Edition.

Aceanthrene O505
4,10-Ace-1,2-benzanthracene O766
8,9-Ace-1,2-benzanthracene O767
Acenaphthanthracene O768
Acenaphthene O433
Acenaphthene choleic acid O434
1,2,2',3'-Acenaphtheno-5,6-benzcarbazole 738
1,2,2',3'-Acenaphtheno-7,8-benzcarbazole 739
1,2,2',3'-Acenaphthenocarbazole 740
1,2,2',3'-Acenaphtheno-3,4-dihydro-5,6-benzcarbazole 741
1,2,2',3'-Acenaphtheno-3,4-dihydro-7,8-benzcarbazole 742
1,2,2',3'-Acenaphtheno-3,4-dihydrocarbazole 743
1,2,2',3'-Acenaphtheno-3,4-dihydro-6-methylcarbazole 744
1,2,2',3'-Acenaphtheno-6-methylcarbazole 745
Acenaphthylene O435
Acetaldehyde O105
4-Acetamidotetraphenylmethane 250
4'-Acetamino-4-dimethylaminoazobenzene O950
4-Acetaminostilbene 251 (O210)
Acetanilide O211
Acetic acid 90 (O106)
β-Acetonaphthone 457
Acetone 91 (O107)
3-(Acetonylbenzyl)-4-hydroxycoumarin 746
Acetophenetidin O212
Acetophenone O213
4'-Acetoxy-1,2-benzanthracene O506
1-Acetoxychrysene O507
9-Acetoxy-1,2,5,6-dibenzanthracene O769
4'-Acetoxy-2,3'-dimethylazobenzene O951
9-Acetoxy-10-methyl-1,2-benzanthracene O508
10-Acetoxymethyl-1,2-benzanthracene O509
10-Acetoxy-1',9-methylene-1,2-benzanthracene O770
Acetoxypregnenolone O1045
2-Acetylaminoanthracene O436
9-Acetylaminoanthracene O437
4-Acetylaminoazobenzene 577
Acetyl-o-aminoazotoluene O952
p-Acetylaminobenzaldehyde thiosemicarbazone 252
4-Acetylaminobenzeneazo-2'-hydroxy-4'-methylbenzene 578
p-Acetylaminobenzoic acid 253
4-Acetylaminobiphenyl 254
2-Acetylaminocarbazole 747
3-Acetylaminocarbazole 748
3-Acetylaminodibenzofuran 749
5-Acetylaminochrysene O510
6-Acetylaminochrysene O511
2-Acetylaminodibenzothiophene 750
3-Acetylaminodibenzothiophene 751
3-Acetylaminodibenzothiophene-5-oxide 752
3-Acetylaminodibenzothiophene sulfone 753
2'-Acetylamino-2,3,6,7-dibenzotropilidene 494
2-Acetylamino-9,10-dihydrophenanthrene 495
2-Acetylamino-9,9-dimethylfluorene 496
3-Acetylaminodiphenylmethane 255
4-Acetylaminodiphenylsulfide 256
3-Acetylaminofluoranthene 530
2-Acetylaminofluorene 497 (O439)
4-Acetylaminofluorene 498
9-Acetylaminofluorene 499
2-Acetylamino-9-fluorenol 500
2-Acetylamino-9-fluorenone 501
2-Acetylaminophenanthrene 502
3-Acetylaminophenanthrene 503
9-Acetylaminophenanthrene 504
1-Acetylaminopyrene 531
2-Acetylaminopyrene 532
10-Acetyl-1,2-benzanthracene O512
2-Acetyl-3,4-benzphenanthrene O513
10-Acetyl-3,4-benzpyrene O771
5-Amino-3,4-benzpyrene O772
Acetyl-5-bromosalicylic acid O214
Acetylcholine O108
Acetylene tetrabromide ..... See 1,1,2,2-Tetrabromoethane
Acetyl-β-naphthylamine O386
Acetylphenothiazine O1155
Acetylsalicylic acid O215
Acetylsulfadiazine O1156
Achromycin ..... See Tetracycline
Acid Fuchsin 257
Acid Red 6B 579
Acid Violet 5BN 258
Acridine O1157

Acrolein O109
Adenine 754
Adenylic acid O1158
Adrenaline O216
Aerosol O.S ..... See Isopropylnaphthalene sodium sulfonate
Aerosol-OT 92 (O110)
Aldrin ..... See 1,2,3,4,10, 10-Hexachloro-1,4,4a,5,8,8a-hexahydro-1,4,5,8-dimethanonaphthalene
Alkyl dimethyl benzyl ammonium chloride 259
Allantoin O1159
Allethrin 260
Alloxan O1160
10-Allyl-1,2-benzanthracene O514
N-Allyl-N'-(m-carboxyphenyl)-isothiourea, sodium salt O217
5-Allyl-5-Δ^2-cyclopentenylbarbituric acid, sodium salt O1161
Allyl formate 93
5,5-Allyl-isopropylbarbituric acid, sodium salt O1162
Allyl isothiocyanate O111
5,5-Allyl-(1-methylbutyl)-barbituric acid, sodium salt O1163
Allyl thiourea O112
Alumium sodium lactate 94
Amaranth (Edicol Amaranth AS) 580 (O1000)
9-Aminoacridine penicillin 755
1-Aminoanthracene 505
2-Aminoanthracene O440
9-Aminoanthracene O441
p-Aminoazobenzene 581 (O953)
4-Amino-1,2'-azonaphthalene O954
o-Aminoazotoluene 582 (O955)
p-Aminoazotoluene 583 (O956)
2-Amino-5-azotoluene ..... See o-Aminoazotoluene
2'-Amino-2,5'-azotoluene 584
2'-Amino-4,5'-azotoluene .. See p-Aminoazotoluene
4'-Amino-2,3'-azotoluene .. See o-Aminoazotoluene
4'-Amino-3,2'-azotoluene 585
4'-Amino-4,2'-azotoluene 586
4'-Amino-4,3'-azotoluene 587
3-Amino-1,2-benzanthracene O515
5-Amino-1,2-benzanthracene O516
8-Amino-1,2-benzanthracene O517
10-Amino-1,2-benzanthracene O518
m-Aminobenzoic acid 261 (O218)
o-Aminobenzoic acid 262
p-Aminobenzoic acid 263
6-Aminochrysene 533
x-Aminochrysene O519
y-Aminochrysene O520
2-Aminodiazine ..... See 2-Aminopyrimidine
9-Amino-1,2,5,6-dibenzanthracene O773
4'-Amino-4-dimethylaminoazobenzene O957
p-Aminodimethylaniline ..... See N,N-Dimethyl-p-phenylenediamine
4'-Amino-2,2'-dimethylazobenzene O958
4-Amino-2',3-dimethylazobenzene O959
6-Amino-3,4'-dimethylazobenzene ..... See p-Aminoazotoluene
4'-Amino-2,3'-dimethylazoxybenzene O961
4-Aminodiphenyl 264
4-Aminodiphenylamine O219
2-Aminofluorene 506 (O442)
2'-Amino-4'-hydroxybenzene-azo-2-fluorene 588
3-Amino-10-methyl-1,2-benzanthracene O521
Amino-20-methylcholanthrene O774
2-Amino-1-(p-methylphenyl)-propane 265
2-Amino-4-methylpyrimidine 756
2-Amino-1-naphthol O387
2-Amino-1-naphthol hydrochloride 458
3-Aminophenanthrene O443
9-Aminophenanthrene O444
p-Aminophenol 266 (O220)
o-Aminophenol hydrochloride 267
Aminopterin 757
4-Aminopteroylglutamic acid ..... See Aminopterin
2-Aminopyrene O522
Aminopyrine O1164
2-Aminopyrimidine 758
p-Aminosalicylic acid 268
p-Aminosalicylic acid, sodium salt 269
4-Aminostilbene 270 (O221)
2-(p-Aminostyryl)-6-(p-acetamidobenzamido)-quinoline 759
4'-Amino-2,4,2',6-tetramethylazobenzene O962
2-Aminothiazole 760
Ammonia 1
Ammonium acetate 2
Ammonium carbonate 3
Ammonium chloride 4
Ammonium hydrophosphate 5
Ammonium hydroxide 6
Ammonium lactate 95
Ammonium paratungstate O1
Ammonium potassium selenide O2
Ammonium sulfamate O3
Ammonium sulfate 7
Amniotin ..... See Estrone

Amyl alcohol O113
5-n-Amyl-1,2-benzanthracene O523
10-n-Amyl-1,2-benzanthracene O524
N-Amyl-N-benzylcyclohexylamine O222
cis-Androstanediol O1046
Androstanediol-3α, 17α 694 (O1047)
Androstane-3α, 17β-diol 695
Androstanediol-3β, 17α O1048
Androstanol-17α-one-3 ..... 696 (O1049)
Androstenediol 697
Δ 5-trans-Androstenediol O1050
Androstenediol dipropionate 698 (O1051)
Androstenedione ..... See Δ4-Androstenedione-3, 17
Δ4-Androstenedione-3, 17 ..... 699 (O1052)
Androstin ..... See Testosterone
Androsterone O1053
Anil 421 ..... O1165
Aniline 271 (O223)
Aniline-azo-2-naphthylamine 589
Aniline hydrochloride 272 (O224)
Anol ..... See p-Hydroxypropenylbenzene
Anthallan ..... See 3'-Di-n-butylaminomethyl-4,5,6-trihydroxybenzo [1,2-c] furan-1' (3')-one
Anthanthrene O924
1',2'-Anthra-1,2-anthracene O925
2',1'-Anthra-1,2-anthracene O926
Anthracene 507 (O445)
Anthraindene O775
9-Anthranylanthracene ..... See 9,9'-Dianthryl
β-Anthraquinoline O1166
β-Anthraquinoline methiodide O1167
Anthraquinone O446
Antibason ..... See 4-Methyl-2-thiouracil
Antimony O4
Antipyrine O1168
ANTU ..... See α-Naphthylthiourea
Areskap 100 ..... See Monobutylphenyl-phenol sodium monosulfonate
Aresklene 400 ..... See Dibutylphenyl-phenol sodium disulfonate
Arsanilic acid 273
Arsenic O5
Arsenic trioxide O6
Arsenious acid O7
Arsenious oxide ..... See Arsenic trioxide
Arsenopyrite O8
Arsphenamine O225
Ascorbic acid 761 (O1169)
2-Ascorbyl palmitate O1170
Aspirin ..... See Acetylsalicylic acid
Atrabrine 762 (O1171)
Atropine sulfate 763
Auramine, base O226
Aureomycin ..... See Chlortetracyclin
Aurothioglycolanilide 274
4'-Aza-1,2-benzanthracene .. See β-Anthraquinoline
5-Aza-1,2-benzanthracene .... See Naphtho-(1,2-g)-quinoline
4'-Aza-3,4-benzphenanthrene .. See Naphtho-(1,2-f)-quinoline
1'-Aza-3,4-benzpyrene .. See 3(N),4-pyridinopyrene
1-Azachrysene ..... See Naphtho-(2,1-f)-quinoline
1-Azaphenanthrene ..... See 5,6-benzoquinoline
Azobenzene 590 (O963)
Azo Blue O964
Azo-bis-isobutyronitrile 591
1,1'-Azonaphthalene O965
1,2'-Azonaphthalene O966
2,2'-Azonaphthalene O967
2,3'-Azotoluene ..... See 2,3'-Dimethylazobenzene
Azoxybenzene 592 (O968)
o-Azoxytoluene O969
Azure A 764
Bacitracin 969
Basic Fuchsin 275
Benadryl 276
Bentyl hydrochloride ..... See β-Diethylaminoethyl 1-cyclohexylcyclo-hexanecarboxylate hydrochloride
Benzaldehyde O227
Benzal-p-aminoazobenzene O970
1,2-Benzanthracene 534 (O525)
1,2-Benzanthracene-10-acetic acid O526
1,2-Benzanthracene-4'-acetic acid, ethyl ester O527
1,2-Benzanthracene-10-acetic acid, methyl ester O528
1,2-Benzanthracene-5-acetic acid, sodium salt O529
1,2-Benzanthracene-10-acetic acid, sodium salt O530
1,2-Benzanthracene-10-aldehyde O531
1,2-Benzanthracene-5-carboxylic acid, sodium salt . O532
1,2-Benzanthracene-10-carboxylic acid, sodium salt O533
1,2-Benzanthracene-9,10-endo-α,β-succinic acid, sodium salt O534
1,2-Benzanthracene-3-hydroxyacetic acid O535
1,2-Benzanthracene-4'-sulfonic acid, ethyl ester O536
1,2-Benzanthracene-4'-sulfonic acid, potassuim salt. O537
1,2-Benzanthracene-4'-sulfonylchloride O538
1,2-Benzanthra-9,10-hydroquinone diacetate O539
10-Benzanthranyl-acetic acid, methyl ester ....See 10-Carbomethoxymethyl-1,2-benzanthracene

1,2-Benzanthra-9,10-quinone O540
Benzanthrene O541
1,9-Benzanthrone O542
1,2-Benzanthryl-3-carbamidoacetic acid O543
1,2-Benzanthryl-10-carbamidoacetic acid O544
1,2-Benzanthryl-10-carbamidoacetic acid, ethyl ester O545
ϵ-(1,2-Benzanthryl-3-carbamido)-caproic acid O546
(1,2-Benzanthryl-10-carbamido)-caproic acid O547
1,2-Benzanthryl-10-carbamido-ethanol O548
1,2-Benzanthryl-10-S-dl-cysteine O549
1,2-Benzanthryl-3-isocyanate O550
1,2-Benzanthryl-10-isocyanate O551
1,2-Benzanthryl-10-mercaptan O552
1,2-Benzanthryl-10-methyl-5-ℓ-cysteine O553
1,2-Benzanthryl-10-methyl-mercaptan O554
3-(1,2-Benz-10-anthryl)-1,2-propyleneglycol dibenzoate O555
10-(1,2-Benzanthryl)-triphenyl lead O556
2',3'-Benz-1,2-benzanthracene ...See 2',3'-Naphth-1,2-anthracene
1,2-Benzcarbazole O1172
15,16-Benzdehydrocholanthrene O927
Benzedrine 277
Benzedrine sulfate O228
Benzene 278 (O229)
Benzene-azo-benzene(-4-)azo(1')-2'ethylaminonaphthalene 593
Benzene-azo-benzene(-4-)azo-3'-methyl-4'-hydroxybenzene 594
Benzene-1-azo-2-naphthol ...See Sudan I
4-Benzeneazo-1-phenyl-3-methyl-5-pyrazolone 595
Benzene diazonium hydroxide 279
Benzene hexachloride O230
Benzene hexachloride, α isomer 280
Benzene hexachloride, β isomer 281
Benzene hexachloride, γ isomer 282
Benzene hexachloride, δ isomer 283
Benzene hexachloride, mixed isomers 284
p-Benzenesulphonic acid diazonium hydroxide, sodium salt 285
Benzerythrene O231
Benzestrol...See 2,4-di(p-Hydroxyphenyl)-3-ethylhexane
1,2-Benzflourene...See Chrysofluorene
3,4-Benzflourene O557
Benzidine 286 (O232)
Benzidine disulfonic acid 287
Benzidine sulfate 288 (O233)
4,5-Benz-10,11(1',2'-naphtho)-chrysene O928
3,4-Benzofluoranthrene O776
Benzogynoestryl...See Estrone benzoate
2-(Benzohydryloxy)-N,N-dimethylethylamine hydrochloride ..... See Benadryl
Benzoic acid 0234
4,5-Benzo-2,3,1',2'-indenoindole 765
Benzopurpurin 4B 596
Benzoquinone 289 (O235)
o-Benzoquinone furoxan 766
5,6-Benzoquinoline O1173
3,4-Benzo-9-thiafluorene 767
2-Benzoylaminofluorene 508
2-Benzoylaminofluorene-2'-carboxylic acid, Sodium salt 509
N'-Benzoyl-N,N-dimethyl-p-phenylenediamine 290
Benzoyl peroxide 291
3,4-Benzphenanthrene O558
1,2-Benzpyrene O777
3,4-Benzpyrene 568 (O778)
3,4-Benzpyrene-5-aldehyde O779
3,4-Benzpyrene-3',4'-dicarboxylic acid, potassium salt O780
3,4-Benzpyrene-3',4'-dicarboxylic acid, sodium salt O781
3,4-Benzpyrene-3',4'-dicarboxylic anhydride O782
3,4-Benzpyrene picrate O783
3,4-Benzpyrene-5,8-quinone O784
3,4-Benzpyrene-sulfonic acid O785
8,8-Benzthiophanthrene O1174
10-Benzylacenaphthanthracene O786
Benzyl alcohol O236
2-Benzylaminofluorene 510
10-Benzyl-1,2-benzanthracene O559
Benzyl benzoate 292
N-Benzyl-β-chloropropionamide 293
Benzyl mercaptan O237
4-Benzylmethylaminoazobenzene 597
Benzyl oleate O114
Benzylpenicillin-β-diethylaminoethyl ester, hydriodide 768
Benzyl thiourea O238
Beryllium 8
Beryllium carbonate 9
Beryllium chloride 10
Beryllium fluoride 11
Beryllium hydroxide 12
Beryllium oxide 13
Beryllium phosphate 14
Beryllium silicate 15
Beryllium sulfate 16

cis-Bicyclo(2,2,1-heptene-2,3-dicarboxylic acid), methyl ester 459
Biebrich Scarlet R..... See Scarlet Red
Bilirubin..... O1175
9,10-Bisacetoxymethyl-1,2-benzanthracene..... O560
Bis(2-chloroethyl)-β-naphthylamine..... 460
Bis(p-chlorophenoxy)methane 294
2,2-Bis(p-chlorophenyl)-1,1-dichloroethane 295
Bis(p-chlorophenyl)-methane..... O239
2,2-Bis(p-chlorophenyl)-1,1,1-trichloroethane.. 296 (O240)
Bisdehydrodoisynolic acid..... 511
Bisdehydrodoisynolic acid, methyl ester..... 512
Bisdehydrodoisynolic acid 7-methyl ether..... 513
9,10-Bishydroxymethyl-1,2-benzanthracene O561
2,6-Bis(4-hydroxy-2-methyl-5-isopropoxybenzoyl) p-cresol..... 297
Bismarck brown..... O971
2,2-Bis(p-methoxyphenyl)-1,1,1-trichloroethane 298
p-(Bis-phenylazo)-benzene..... O972
4,4'-Bis(α-phenyl-n-propylamino)diphenylsulfone tetrasodium sulfonate ..... See Sulphetrone
1,9,4,10-Bispyrimidino-anthrone..... O1177
1,9,5,10-Bispyrimidino-anthrone..... O1178
Bis(p-toluenesulfonoxyethyl)aniline..... 299
Boric acid..... 17
Boron 18
Boron trifluoride..... 19
Boron trifluoride dimethyl ether 20
Brilliant Blue 300
10-Bromo-1,2-benzanthracene..... 535
6-Bromo-1,2-benzcarbazole..... 769
α-Bromobenzyl cyanide O241
3'-Bromo-4-dimethylaminoazobenzene..... 598
5-Bromo-9,10-dimethyl-1,2-benzanthracene O562
4'-Bromo-7-methyl-8,9-ace-1,2-benzanthracene O787
Bufagin..... O1054
Bufotalin..... O1055
Bufotoxin O1056
Bulbocapnine O1176
Butadiene dioxide ..... See 1,2,3,4-Diepoxybutane
1,3-Butanediol 96
1,2,4-Butanetriol..... 97
Butazolidine 770
Butisol sodium.....
See sec-Butyl ethyl barbituric acid, sodium salt
Butoxypolypropylene glycol 98
Butter yellow.....See p-Dimethylaminoazobenzene
Butyl alcohol O115
5-n-Butyl-1,2-benzanthracene O563
10-n-Butyl-1,2-benzanthracene..... O564
n-Butyl carbamate..... O1330
Butyl carbitol .....
...See Diethylene glycol mono-butyl ether
20-t-Butylcholanthrene..... O788
10-n-Butyl-1,2,5,6-dibenzacridine..... 771
2-sec-Butyl-4,6-dinitrophenol 301
sec-Butyl ethyl barbituric acid, sodium salt..... O1179
N-n-Butyl ethyl carbamate..... 99
t-Butyl hydroperoxide 100
n-Butylidene chloride..... 101
n-Butyl d,ℓ-malate..... 102
N-sec-Butyl phthalimide..... 302
Butyl stearate..... 103
N-Butyl-1,2,3,6-tetrahydronaphthalimide.....
.....See N-Butyl-1,2,3,6-tetrahydrophthalimide
N-Butyl-1,2,3,6-tetrahydrophthalimide..... 772
n-Butyric acid 104 (O116)
9-n-Butyrylamino-1,2,5,6-dibenzanthracene..... O789
Cadmium O9
Cadmium carbonate O10
Cadmium chloride 21 (O11)
Cadmium oxide 22 (O12)
Cadmium phosphate O13
Cadmium subsalicylate..... O14
Cadmium sulfate 23 (O15)
Cadmium sulfide 24
Caffeine..... O1180
Calciferol (Vitamin D_2) O388
Calcium arsenate O16
Calcium arsenite..... O17
Calcium carbonate..... 25
Calcium chloride..... 26 (O18)
Calcium fluoride 27
Calcium gluconate O117
Camphor..... 461
Cantharidine..... O1181
Capric acid O118
Caprolactam..... 773
ε-Caprolactam polymer 105
Carbazole O1182
Carbitol ... See Diethylene glycol monoethyl ether
"4'-Carbomethoxy-2,3'-dimethylazobenzene" .....
See 2,3'-Dimethylazobenzene-4'-methylcarbonate
6-Carbomethoxy-10-methyl-1,2-benzanthracene O565
7-Carbomethoxy-10-methyl-1,2-benzanthracene O566
Carbon disulfide..... 106 (O120)
Carbon tetrachloride..... 107 (O119)
3-Carboxymethoxy-1,2-benzanthracene .....
...See 1,2-Benzanthracene-3-hydroxyacetic acid

6-Carboxy-10-methyl-1,2-benzanthracene ...See 10-Methly-1,2-benzanthracene-6-carboxylic acid
3-(α-Carboxyethyl-α-thiomercuri)-2-methoxypropylurea 108
3-Carboxymethylthiomercuri-2-methoxypropylurea 109
Carotene 303 (O242)
Castrix.. See 2-Chloro-4-dimethylamino-6-methylpyrimidine
Catechol O243
Cellosolve...See Ethylene glycol monoethyl ether
Cephalin O121
Cerium O19
9-Cetyl-5,6-benzoflavin O1183
Cetyl dimethyl ethyl ammonium bromide 110
Cetyl pyridinium chloride O1184
Chloracetone O122
Chloracetyl-o-aminoazotoluene O973
Chloral hydrate O123
Chloralose O124
Chlordan .....See 1,2,4,5,6,7,8,8-Octachloro-4,7-methano-3a,4,7,7a-tetrahydroindan
ω-Chloroacetophenone O244
10-Chloro-1,2-benzanthracene 536
2'-Chloro-1,2-benzcarbazole 774
6-Chloro-1,2-benzcarbazole 775
2'-Chloro-1,2,5,6-dibenzcarbazole 776
7-Chloro-4-(4-diethylamino-1-methylbutylamino)-quinoline ..... See Chloroquine
1-Chloro-1,1-difluoroethane 111
2'-Chloro-4-dimethylaminoazobenzene 599
3'-Chloro-4-dimethylaminoazobenzene 600
4'-Chloro-4-dimethylaminoazobenzene 601
2-Chloro-4-dimethylamino-6-methylpyrimidine 777
2'-Chloro-4-dimethylaminostilbene 304
4'-Chloro-2,3'-dimethylazobenzene O974
10-Chloro-6,7-dimethyl-5,10-dihydro-1,2-benzophenarsazine 778
10-Chloro-6,7-dimethyl-5,10-dihydro-3,4-benzophenarsazine 779
10-Chloro-6,9-dimethyl-5,10-dihydro-3,4-benzophenarsazine 780
N-β-Chloroethyl-p-aminoazobenzene 602
β-Chloroethyl carbamate 112 (O1331)
6-Chloro-9-ethyl-1,2-benzacridine O1185
2-Chlorofluorene O447
Chloroform 113 (O125)
Chloroguanide 305
3-Chloromercuri-2-methoxypropylurea 114
3-Chloro-7-methoxy-9-(1-methyl-4-diethylamino-butylamino)-acridine dihydrochloride dihydrate .....See Atrabrine
5-Chloro-10-methyl-1,2-benzanthracene O567
6-Chloro-10-methyl-1,2-benzanthracene O568
7-Chloro-10-methyl-1,2-benzanthracene O569
10-Chloromethyl-1,2-benzanthracene O570
2'-Chloro-6-methyl-1,2-bencarbazole 781
3-Chloro-20-methylcholanthrene O790
6-Chloro-20-methylchplanthrene O791
Chloromycetin 306
2-Chloro-4-nitrobenzeneazo-2'-amino-4'-methoxy-5'-methylbenzene 603
Chloroquine 782
Chloroquinone O245
5-Chloro-o-toluidine O246
5-Chloro-o-toluidine hydrochloride O247
Chlortetracycline 537
Cholanthrene 569 (O792)
$\Delta^{2,4}$-Cholestadiene O1057
$\Delta^{3,5}$-Cholestadiene O1058
$\Delta^{2,4}$-Cholestadiene peroxide O1059
Cholestene O1060
Cholestenone O1061
Cholestenone-6-sulfonic acid, sodium salt O1062
Cholesterol 700 (O1063)
Cholesterol benzoate O1064
Cholesterol palmitate O1065
Cholesterol stearate O1066
α-Cholesterylene .....See $\Delta^{3,5}$-Cholestadiene
Cholesteryl linoleate 701
Cholesteryl oleate 702 (O1067)
Cholic acid 703 (O1068)
Chromite O20
Chromium O21
Chrysarobin O448
Chrysene 538 (O571)
Chrysene sulfonic acid, sodium and ammonium salts .. O572
Chrysofluorene O573
Chrysoidin ....See 2,4-Diaminoazobenzene-4-hydrochloride
Chrysoidin R .....See 5-Methyl-2,4-diaminoazobenzene
Chrysoidin Y .....See 2,4-Diaminoazobenzene
Chrysoin SGX 604
Cinobufagin O1069
Cloth Red B 605
Cobalt O22
Cobalt chloride 28
Cobalt cysteine complex 115

Cobalt fluoride 29
Cobalt histidine complex..... 783
Cobalt nitrate 30
Cobalt sulfate 31
Colchicine..... 514 (O449)
Color Index No. 30.....See Hexacol Supra Red 10B
Color Index No. 57.....See Acid Red 6B
Color Index No. 672 .....See Patent Blue V
Color Index No. 698 .....See Acid Violet 5BN
Compound F. .....See 17-Hydroxycorticosterone
Congo Red..... O975
Copper 32
Copper (ic) chloride 33
Copper sodium tartrate 116
Copper sulfate 34 (O23)
Corticosterone..... 704
Cortisone..... 705
Cortisone acetate 706
p-Cresol..... O248
Cumertilin 784
10-Cyano-1,2-benzanthracene..... O574
α-Cyanocyclohexaneacetic acid, ethyl ester.....
.....see Ethyl cyanocyclohexyl acetate
5-Cyano-9,10-dimethyl-1,2-benzanthracene O575
10-Cyanomethyl-1,2-benzanthracene..... O576
5-Cyano-10-methyl-1,2-benzanthracene O577
6-Cyano-10-methyl-1,2-benzanthracene O578
7-Cyano-10-methyl-1,2-benzanthracene O579
6-Cyano-20-methylcholanthrene..... O793
Cyclohexane 307 (O249)
Cyclohexane carboxylic acid, cyclopentyl ester..... 308
Cyclohexanone 309
Cyclohexyl acetoacetate..... 310
Cyclohexyl azelate..... 311
2-Cyclohexyl-4,6-dinitrophenol..... 312
dl-1-Cyclohexyl-2-methylaminopropane 313
Cyclopal .....See 5-Allyl-5-Δ^2-cyclopentenyl-barbituric acid, sodium salt
1,2-Cyclopenteno-5,10-aceanthrene O794
1,2-Cyclopentenoacenaphthene-3'-spirocyclo-2''-methylcyclohexane O795
5,6-Cyclopenteno-1,2-benzanthracene O791
6,7-Cyclopenteno-1,2-benzanthracene O797
1,2-Cyclopenteno-5-methylanthracene..... O580
1,2-Cyclopentenophenanthrene 539 (O581)
3,4-Cyclopentenophenanthrene O582
Cyclotrimethylenetrinitramine..... 785
Cymarin O1070
l-Cystine ..... O126 and Add.
D-40 .....See Sodium alkyl aryl sulfonate
DDD...See 2,2-bis (p-chlorophenyl)-1,1-dichloroethane
DDT.....See 2,2-bis (p-chlorophenyl)-1,1,1-trichloroethane
Decahydronaphthalene 462 (O389)
Decalin.....See Decahydronaphthalene
trans-β-Decalol 463
Decamethylene-1,10-bis-trimethylammonium iodide 117
Decapryn succinate..... 786
Decylbenzene sodium sulfonate 314
Dehydroacetic acid 787
Dehydroandrosterone O1071
trans-Dehydroandrosterone..... O1072
Dehydrodesoxycholic acid O1073
Dehydroisoandrosterone ..See trans-Dehydroandrosterone
Δ^5-trans-Dehydroisoandrosterone ....See Dehydroandrosterone
Dehydronorcholene O1074
Δ^3-Dehydro-3,4-trimethylene-isobenzanthrene-2 .... O798
Demerol hydrochloride.....See Meperidine hydrochloride
Deoxycholic acid .....See Desoxycholic acid
Desoxycholic acid..... 707 (O1075)
Desoxycorticosterone..... 708 (O1076)
Desoxycorticosterone acetate 709 (O1077)
9,10-Diacetoxy-1,2-benzanthracene .....See 9,10-Benzanthrahydroquinone diacetate
5,6-Diacetoxychrysene O583
Diacetyl-o-aminoazotoluene O976
2,2'-Diacetylamino-9,9'-bifluoryl..... 515
2,2'-Diacetylamino-9,9'-bifluorylidine 516
9-Diacetylamino-1,2,5,6-dibenzanthracene..... O799
N-Diacetyl-2-aminofluorene..... O450
N,N-Diacetyl-2-aminofluorene..... 517
2,7-Diacetylaminofluorene 518
N,N'-Diacetyl-p-phenylenediamine O251
Dialin.....See Dihydronaphthalene
4,4'-Diamidinostilbene .....See Stilbamidine
2,6-Diaminoanthrapyrimidine 788
2,4-Diaminoazobenzene O977
2,4-Diaminoazobenzene-4-hydrochloride O978
2',4'-Diaminobenzene-azo-2-fluorene 606
2,4-Diamino-5-p-chlorophenyl-6-ethylpyrimidine ... 789
2,4'-Diamino-5-dimethylaminodiphenyl 315
4',6'-Diamino-2,3'-dimethylazobenzene....See 2',5-Dimethyl-2,4-diaminoazobenzene
2,2'-Diamino-1,1'-dinaphthyl..... O390
1,2'-Diamino-1',2-dinaphthyl..... O391
2,2'-Diamino-1,1'-dinaphthyl..... O979
2,4-Diaminodiphenylamine O252

4,4'-Diaminodiphenylmethane 316
2,5-Diaminotoluene O253
2,5-Diaminotoluene dihydrochloride..... O254
p-Di-n-amylaminoazobenzene..... O980
Dianisidine..... 317
Dianisylhexene ..... See 4,4'-Dihydroxy-α, β-diethylstilbene dimethyl ether
9,9'-Dianthryl..... O451
Diazoaminobenzene..... 607 (O981)
1,2,5,6-Dibenzacridine O1186
1,2,7,8-Dibenzacridine O1187
1,2,7,8-Dibenzacridine methosulfate O1188
1,2,3,4-Dibenzanthracene..... O800
1,2,5,6-Dibenzanthracene..... 570 (O801 and Add.)
1,2,7,8-Dibenzanthracene..... O802
2,3,6,7-Dibenzanthracene.....See Pentacene
1,2,5,6-Dibenzanthracene choleic acid..... O803
1,2,5,6-Dibenzanthracene-disulfonic acids, sodium salts..... O804
1,2,5,6-Dibenzanthracene-9,10-endo-α,β-succinic acid..... O805
1,2,5,6-Dibenzanthracene-9,10-endo-α, β-succinic acid, sodium salt..... O806
1,2,5,6-Dibenzanthracene-endo-α,β-succinoylglycine ethyl ester..... O807
1,2,5,6-Dibenzanthracene-sulfonic acids, sodium salts..... O808
1,2,5,6-Dibenz-9-anthranol ..... See 9-Hydroxy-1,2,5,6-dibenzanthracene
1,2,5,6-Dibenzanthranyl-9-carbamido-acetic acid ... O809
1,2,5,6-Dibenzanthranyl-9-carbamido-casein O810
1,2,5,6-Dibenzanthranyl-9-isocyanate O811
N-1,2,5,6-Dibenzanthranyl-succinimide..... O812
1,2,5,6-Dibenzanthaquinone O813
Dibenzanthrone O929
10-(Di-1,2-benzanthryl)-diphenyl lead..... O584
1,2,5,6-Dibenzcarbazole 790 (O1189)
1,2,7,8-Dibenzcarbazole O1190
3,4,5,6-Dibenzcarbazole 791 (O1191)
1,2,1',2'-Dibenz-6,6'(or 7,7') dianthryl..... O585
Dibenzfluoranthene O930
1,2,3,4-Dibenzfluorene O814
1,2,5,6-Dibenzfluorene (1,2,5,6-Dibenzofluorene) 517 (O815)
1,2,7,8-Dibenzfluorene (1,2,7,8-Dibenzofluorene) 572 (O816)
3,4,5,6-Dibenzfluorene O817
1,2,5,6-Dibenzfluorenone O818
1,2,3,4-Dibenzphenanthrene..... O819
1,2,5,6-Dibenzphenanthrene..... O820
3,4,5,6-Dibenzphenanthrene..... O821
1,2,5,6-Dibenzphenazine O1192
1,2,3,4-Dibenzpyrene O931
3,4,8,9-Dibenzpyrene O932
3,4,8,9-Dibenzpyrene-5,10-hydroquinone sodium sulfite..... O933
3,4,8,9-Dibenzpyrene-5,10-quinone..... O934
Dibenzyl O255
9,10-Dibenzylanthracene..... O452
N,N-Dibenzyl-β-chloroethylamine 318
9,10-Dibenzyl-1,2,5,6-dibenzanthracene O822
N,N'-Dibenzylethylenediamine penicillin..... 792
N,N'-Dibenzyl thiourea..... O256
β,β'-Dibromodiethyl sulfide..... O127
β,β'-Dibromodiethyl sulfone O128
5,5'-Dibromo-2,2'-dihydroxybenzil..... 319
Dibutoxyethyl diglycol carbonate 118
Dibutoxyethyl phthalate..... 320
p-Di-n-butylaminoazobenzene..... O982
3'-Di-n-butylaminomethyl-4,5,6-trihydroxybenzo[1, 2-c] furan-1'(3')-one 793
Di-(butyl cellosolve) azelate..... 119
9,10-Di-n-butyl-1,2,5,6-dibenzanthracene..... O823
N,N-Di-n-butyl ethyl carbamate..... 120
Dibutylphenyl-phenol sodium disulfonate..... 321
N,N-Di-n-butyl-p-phenylenediamine O257
Dibutyl phthalate 322
Dibutyl sebacate..... 121
Dicapryl phthalate 323
3,4-Dicarbomethoxyphenanthrene O453
9,10-Dichloro-1,2-benzanthracene..... 540
p-Dichlorobenzene..... 324 (O258)
1,1-Dichloro-2,2-bis(p-chlorophenyl)ethane O259
β,β'-Dichlorodiethyl ether..... O129
β,β'-Dichlorodiethyl sulfide..... 123 (O130)
β,β'-Dichlorodiethyl sulfone O131
β,β'-Dichlorodiethyl sulfoxide..... O132
2',5'-Dichloro-4-dimethylaminoazobenzene..... 608
p,p'-Dichlorodiphenylacetic acid, sodium salt..... O260
Di-(2-chloroethyl)-amine hydrochloride 122
2,2'-Dichloroisopropyl-N,N-diethylcarbamate 124
2,2'-Dichloroisopropyl-N-ethyl carbamate..... 125
Dichloromercuro-3,4-benzpyrene..... O824
Dichloromethane O133
2,4-Dichlorophenoxyacetic acid..... 325 (O261)
4,4'-Dichlorophenyldichloroethylene O262
N'-3,4-Dichlorophenyl-N^5-isopropyl diguanide hydrochloride..... 326
1,2-Dichloropropane O134
Dicholesteryl ether..... O1078

Dicumarol 794
Dieldrin 795
Diels hydrocarbon ..... See 3'-Methyl-1,2-cyclopentenophenanthrene
Diels hydrocarbon No. 2 ..... O825
Dienestrol.....See 4,4'-Dihydroxy-γ,δ-diphenyl-β,δ-hexadiene
Dienestrol diacetate ..... See 4,4'-Dihydroxy-γ,δ-diphenyl-β,δ-hexadiene diacetate
1,2,3,4-Diepoxybutane 796
1,2,5,6-Diepoxyhexane 797
N,N-Diethanol-p-aminoazobenzene 609 (O983)
Diethoxydimethylsilane 126
α,α-Di-(p-ethoxyphenyl)-β-phenylbromoethylene O263
Diethyl amido laurate 127
Diethylamine 128
p-Diethylaminoazobenzene 610 (O984)
x-(β-Diethylaminoethyl)-aminochrysene O586
β-Diethylaminoethyl 1-cyclohexylcyclohexane-carboxylate hydrochloride 327
β-Diethylaminoethylfluorene-9-carboxylate hydrochloride O454
β-Diethylaminoethylxanthene-9-carboxylate methobromide 798
10-Diethylaminomethyl-1,2-benzanthracene O587
Diethylaminostilbene 328
5,5-Diethylbarbituric acid, sodium salt O1193
9,10-Diethyl-1,2-benzanthracene O588
2,9-Diethyl-3,4-benzphenanthrene O589
Diethyldihydrostilbene 329
Diethylene glycol 129 (O135)
Diethylene glycol dicaprate 130
Diethylene glycol monobutyl ether O136
Diethylene glycol monobutyl ether acetate 131
Diethylene glycol monoethyl ether O137
Diethylene glycol monomethyl ether O138
N,N-Diethyl ethyl carbamate 132
Di-2-ethylhexyl adipate 133
Di-(2-ethylhexyl)-phthalate 330
1,2-Diethylnaphthalene O392
Diethyl p-nitrophenyl thiophosphate ....See p-Nitrophenyl diethyl thiophosphate
2,2-Diethyl-1,3-propanediol 134
Diethylstilbene O264
Diethylstilbestrol ...See 4,4'-Dihydroxy-α,β-diethylstilbene
Diethylstilbestrol dipropionate..See 4,4'-Dihydroxy-α,β-diethylstilbene dipropionate
Diethylstilbestrol disulfate, di-potassium salt ..... See 4,4'-Dihydroxy-α,β-diethylstilbene disulfate, di-potassium salt
Diethylstilboestrol ..... See 4, 4'-dihydroxy-α,β-diethylstilbene
N,N-Diethylsuccinamide n-propyl ester 135
5,5-Diethyl-2-thiobarbituric acid 799
2',4'-Difluoro-4-dimethylaminoazobenzene 611
2',5'-Difluoro-4-dimethylaminoazobenzene 612
3',5'-Difluoro-4-dimethylaminoazobenzene 613
1,1-Difluoroethane 136
Digentisic acid 970
Digentisic-gallic acid 971
Digitonin O1079
Digitoxigenin O1080
Digitoxin O1081
1', 2'-Dihydro-3,4-benzpyrene-3',4'-dicarboxylic anhydride O826
meso-Dihydrocholanthrene O827
9,10-Dihydro-1,2,6,7-dibenzacridine O1194
9,10-Dihydro-3,4,5,6-dibenzacridine O1195
9,10-Dihydro-1,2,5,6-dibenzanthracene O828
3,4-Dihydro-1,2,5,6-dibenzcarbazole 800
3,4-Dihydro-1,2,7,8-dibenzcarbazole 801
5,10-Dihydro-3,4,8,9-dibenzpyrene (?) O935
α-Dihydroequilenin O1082
β-Dihydroequilenin O1083
Dihydroergocornine 802
Dihydroergocristine 803
Dihydroergotamine 804
Dihydroestrin benzoate ..... See Estradiol benzoate
Dihydrofolliculin benzoate ....See Estradiol benzoate
7,8-Dihydro-5-methyl-1,2-benzanthracene O590
9,10-Dihydro-10-methyl-1,2-benzanthracene O591
1',2'-Dihydro-4'-methyl-3,4-benzpyrene O829
6,7-Dihydro-20-methylcholanthrene O830
meso-Dihydro-20-methylcholanthrene O831
Dihydro-20-methylcholanthrene-dicarboxylic acid, potassium salt O832
9,10-Dihydronaphthacene O592
Dihydronaphthalene O393
5,6-Dihydronaphtho-(1,2-g)-quinoline O1196
3,4-Dihydrophenanthrene-1,2-dicarboxylic anhydride O455
7,8-Dihydrophenalyl-7-spirocyclopentane O456
Dihydrorotenone 805
Dihydrotachysterol O1084
Dihydrotestosterone O1085
Dihydrotheelin ..... See Estradiol
Dihydrostreptomycin 806

2,4-Dihydroxyazobenzene 614
2,4-Dihydroxyazobenzene-2',4'-disulphonic acid sodium salt 615
2',4'-Dihydroxybenzene-azo-2-fluorene 616
3,3'-Dihydroxybenzidine 331
Di-p-hydroxybenzoic acid 972
3',7'-Dihydroxy-1,2,5,6-dibenzanthracene O833
4',8'-Dihydroxy-1,2,5,6-dibenzanthracene O834
Dihydroxy-1,2,5,6-dibenzanthracene O835
4,4'-Dihydroxy-α,β-dibenzylidenedibenzyl O265
9,10-Dihydroxy-9,10-di-n-butyl-9,10-dihydro-1,2,5,6-dibenzanthracene O836
9,10-Dihydroxy-9,10-dicyclohexyl-9,10-dihydro-1,2,5,6-dibenzanthracene O837
9,10-Dihydroxy-9,10-dicyclopentyl-9,10-dihydro-1,2,5,6-dibenzanthracene O838
Dihydroxydiethyldihydrostilbene ..... See γ,δ-Di-(p-hydroxyphenyl)-hexane
4,4'-Dihydroxy-α,β-diethylstilbene 332 (O266)
4,4'-Dihydroxy-α,β-diethylstilbene dibenzoate O267
4,4'-Dihydroxy-α,β-diethylstilbene dimethyl ether 333 (O268)
4,4'-Dihydroxy-α,β-diethylstilbene dipropionate ..... 334 (O270 and Add.)
4,4'-Dihydroxy-α,β-diethylstilbene disulfate, dipotassium salt 335
4,4'-Dihydroxy-α,β-diethylstilbene monomethyl ether O271
9,10-Dihydroxy-9,10-dimethyl-9,10-dihydro-1,2-benzanthracene ..... See 9,10-Dimethoxy-9,10-dimethyl-9,10-dihydro-1,2-benzanthracene
4,4'-Dihydroxy-α,β-dimethyl stilbene O272
1,2-Dihydroxy-1,2-di-α-naphthylacenaphthene O457
1,2-Dihydroxy-1,2-diphenylacenaphthene O458
4,4'-Dihydroxy-γ,δ-diphenyl-β,δ-hexadiene 336 (O273)
4,4'-Dihydroxy-γ,δ-diphenyl-β,δ-hexadiene diacetate 337
4,4'-Dihydroxy diphenyl hexane ..... See γ,δ-Di-(p-hydroxyphenyl)-hexane
Dihydroxydiphenylhexane dipropionate ... See γ,δ-Di-(p-hydroxyphenyl)-hexane dipropionate
4,4'-Dihydroxydiphenylmethane O274
9,10-Dihydroxy-9,10-di-n-propyl-9,10-dihydro-1,2,5,6-dibenzanthracene O839
Dihydroxyestrin ..... See Estradiol
2,7-Dihydroxynaphthalene O394
2,4-Di-(p-hydroxyphenyl)-3-ethylhexane O275
γ,δ-Di-(p-hydroxyphenyl)-hexane 338 (O276)
γ,δ-Di-(p-hydroxyphenyl)-hexane dipropionate 339
1-(3,4-Dihydroxyphenyl)-2-isopropylaminoethanol hydrochloride 340
β,β-Di-(4-hydroxyphenyl)-propane O277
Dihydroxypyrene-disulfonic acid, di-sodium salt O593
4,4'-Dihydroxystilbene O278
β,β'-Diiododiethyl sulfone O139
3,5-Diiodotyrosine O279
Diisobutyl ketone 137
1,5-Di-isopropenylanthracene O459
N,N-Diisopropyl ethyl carbamate 138
Diisopropyl fluorophosphate 139 (O140)
Diisopropyl fluorophosphonate ..... See Diisopropyl fluorophosphate
Diisopropyl tartrate 140
Dimenformone ..... See Estradiol benzoate
1,4-Dimethanesulphonoxy butane 141
1,6-Dimethanesulphonoxy hexane 142
3,10-Dimethoxy-1,2-benzanthracene O594
9,10-Dimethoxy-1,2-benzanthracene O595
5,8-Dimethoxy-3,4-benzpyrene O840
5,10-Dimethoxy-3,4-benzpyrene O841
5,6-Dimethoxychrysene O596
9,10-Dimethoxy-1,2,5,6-dibenzanthracene O842
2',3'-Dimethoxy-1,2,5,6-dibenzcarbazole 807
9,10-Dimethoxy-9,10-dimethyl-9,10-dihydro-1,2-benzanthracene O597
γ,δ-Di-(p-methoxyphenyl)-hexane O280
3,3'-Dimethoxytriphenylmethane-4,4'-bis(1''-azo-2''-naphthol) 617
1,2-Dimethyl-5,10-aceanthrene O598
9,10-Dimethyl-3,4-ace-1,2-benzanthracene O843
2,3-Dimethyl-6,7-acechrysene O844
p-Dimethylaminoazobenzene 618 (O985)
2'3'-Dimethyl-4-aminoazobenzene 619
4-Dimethylaminoazobenzene-4'-arsonic acid O986
4-Dimethylaminoazobenzene-4'-stibinic acid O987
4-Dimethylaminoazobenzene-4'-sulfonic acid, sodium salt O988
p-Dimethylaminobenzalaniline 341 (O281)
4'-Dimethylaminobenzalaniline ..... See 4'-Dimethylaminobenzylidine-aniline
p-Dimethylaminobenzaldehyde O282
4'-Dimethylaminobenzene-azo-2-fluorene 620
p-Dimethylaminobenzeneazo-1-naphthalene 621 (O989)
p-Dimethylaminobenzene-1-azo-1-naphthalene .. See p-Dimethylaminobenzeneazo-1-naphthalene
p-Dimethylaminobenzene-1-azo-2-naphthalene . 622 (O990)
p-Dimethylaminobenzenediazo sodium sulfonate 623
4'-Dimethylaminobenzylideneaniline 342 (O283)

4-Dimethylaminobiphenyl 343
3-Dimethylaminocarbazole 808
4-Dimethylaminochalcone 344
6-Dimethylamino-[2-(2,5-dimethyl-1-phenyl-3-pyrryl)-vinyl]-1-methyl-quinolinium chloride 809
3,2'-Dimethyl-4-aminodiphenyl 345
6-Dimethylamino-4,4-diphenyl-3-heptanone 346
N-Dimethyl-2-aminofluorene 520
p-Dimethylaminohydrazobenzene O991
10-Dimethylaminomethyl-1,2-benzanthracene O599
4-Dimethylamino-2'-methylstilbene O284
1-(4'-Dimethylaminophenyl)-2-(1'-naphthyl)-ethylene O395
4-Dimethylaminostilbene 347 (O285)
N,N-Dimethylaminostilbene ..... See 4-Dimethylaminostilbene
4-Dimethylaminotriphenylmethane 348
1,2-Dimethylanthracene O460
1,3-Dimethylanthracene O461
1,4-Dimethylanthracene O462
2,3-Dimethylanthracene O463
9,10-Dimethylanthracene O464
2,3'-Dimethylazobenzene O992
2,3'-Dimethylazobenzene-4'-diazonium sulfate O993
2,3'-Dimethylazobenzene-4'-methylcarbonate O994
1,2-Dimethyl-5,6-benzacridine 810
1,10-Dimethyl-5,6-benzacridine 811
2,10-Dimethyl-5,6-benzacridine 812
1,2-Dimethyl-7,8-benzacridine 813
1,10-Dimethyl-7,8-benzacridine 814 (O1197)
2,10-Dimethyl-7,8-benzacridine 815 (O1199)
3,10-Dimethyl-7,8-benzacridine 816 (O1200)
5,9-Dimethyl-3,4-benzacridine ..... See 1,10-Dimethyl-7,8-benzacridine
6,9-Dimethyl-1,2-benzacridine O1198
6,9-Dimethyl 3,4-benzacridine ..... See 2,10-Dimethyl-7,8-benzacridine
7,9-Dimethyl-3,4-benzacridine ..... See 3,10-Dimethyl-7,8-benzacridine
6,10-Dimethyl-7,8-benzacridine 817
N,N-Dimethyl-N'-benzal-p-phenylenediamine O286
1',10-Dimethyl-1,2-benzanthracene O600
2',6-Dimethyl-1,2-benzanthracene O601
2',7-Dimethyl-1,2-benzanthracene O602
3',6-Dimethyl-1,2-benzanthracene O603
3',7-Dimethyl-1,2-benzanthracene O604
3,9-Dimethyl-1,2-benzanthracene O605
4,9-Dimethyl-1,2-benzanthracene O606
4,10-Dimethyl-1,2-benzanthracene O607
5,6-Dimethyl-1,2-benzanthracene O608
5,8-Dimethyl-1,2-benzanthracene O609
5,9-Dimethyl-1,2-benzanthracene O610
5,10-Dimethyl-1,2-benzanthracene O611
6,7-Dimethyl-1,2-benzanthracene O612
6,8-Dimethyl-1,2-benzanthracene 541
8,10-Dimethyl-1,2-benzanthracene O613
9,10-Dimethyl-1,2-benzanthracene 542 (O614)
9,10-Dimethyl-1,2-benzanthracene-endo-α,β-succinic acid, sodium salt O615
9,10-Dimethyl-1,2-benzanthracene-9,10-peroxide O616
9,10-Dimethyl-1,2-benzanthracene photo-oxide .. See 9,10-Dimethyl-1,2-benzanthracene-9,10-peroxide
9,10-Dimethyl-1,2-benzanthracene-9,10-oxide ..... See 9,10-Dimethyl-9,10-dihydro-1,2-benzanthraceneoxide
5,8-Dimethyl-1,2-benzcarbazole 818
6,12-Dimethylbenzo[1,2b:5,4b']dithionaphthene 819
2,9-Dimethyl-3,4-benzphenanthrene O617
6,7-Dimethyl-3,4-benzphenanthrene O618
4,9-Dimethyl-2,3-benzthiophanthrene O1201
4,9-Dimethyl-5,6-benzthiophanthrene O1202
N',N'-Dimethyl-N-benzyl-N-phenylethylenediamine 350
1,3-Dimethyl-4,6-bis(chloromethyl)benzene 349
α,α-Dimethyl-α'-carbobutoxydihydro-γ-pyrone 820
15,20-Dimethylcholanthrene O845
16,20-Dimethylcholanthrene O846
2,3-Dimethylchrysene O619
4,5-Dimethylchrysene O620
5,6-Dimethylchrysene O621
3,4-Dimethylcyclopentenophenanthrene 543
3,6-Dimethylcyclopentenophenanthrene 544
3,8-Dimethylcyclopentenophenanthrene 545
3',8-Dimethylcyclopentenophenanthrene 546
3,9-Dimethylcyclopentenophenanthrene O622
3',9-Dimethylcyclopentenophenanthrene 547
9,10-Dimethylcyclopentenophenanthrene 548
2',5-Dimethyl-2,4-diaminoazobenzene O996
9,10-Dimethyl-1,2,3,4-dibenzanthracene O847
9,10-Dimethyl-1,2,5,6-dibenzanthracene O848
9,10-Dimethyl-1,2,7,8-dibenzanthracene O849
1,4'-Dimethyl-1,2,5,6-dibenzcarbazole 821
2',3'-Dimethyl-1,2,5,6-dibenzcarbazole 822
2',3'-Dimethyl-1,2,7,8-dibenzcarbazole 823
4,9-Dimethyl-2,3,5,6-dibenzothiophanthrene .. 824 (O1203)
4,9-Dimethyl-1,2,7,8-dibenzthiophanthrene O1204
9,10-Dimethyl-9,10-dihydro-1,2-benzanthracene 549
9,10-Dimethyl-9,10-dihydro-1,2-benzanthracene-9,10-oxide O623

cis-9,10-Dimethyl-9,10-dihydro-1,2,5,6-dibenzanthracene O850
2,4'-Dimethyl-4-dimethylaminoazobenzene O997
2',4'-Dimethyl-4-dimethylaminoazobenzene 624
2',5'-Dimethyl-4-dimethylaminoazobenzene 625
3 ,4'-Dimethyl-4-dimethylaminoazobenzene O998
3 ',5'-Dimethyl-4-dimethylaminoazobenzene 626
Dimethyl dinaphthyl pyrene O624
O,O-Dimethyldithiophosphate ester of diethyl mercaptosuccinate ..... See Malathion
4',3 -Dimethylene-1,2,5,6-dibenzanthracene .... See Phenanthra-acenaphthene
Dimethyl ethyl allenolic acid methyl ether 464
Di-N-methyl ethyl carbamate 143
6,9-Dimethyl flavin O1205
2,4-Dimethylfluoranthene O625
N,N-Dimethyl-4'-hydroxy-p-aminoazobenzene 627
2',3-Dimethyl-4-monomethylaminoazobenzene 628
7,7'-Dimethyl-2',3'-naphtho-1,2-anthracene O851
2,6-Dimethyl-1,4-naphthoquinone-2,3-dimethylbutadiene O465
2,6-Dimethyl-3,4-naphthoquinone-2,3-dimethylbutadiene O466
1,9-Dimethylphenanthrene O467
N,N-Dimethyl-p-phenylenediamine O287
N,N-Dimethyl-p-phenylenediamine monohydrochloride O289
dl-α-1,3-Dimethyl-4-phenyl-4-propionoxypiperidine hydrochloride 825
ℓ-β-1,3-Dimethyl-4-phenyl-4-propionoxypiperidine D-acid tartrate 826
N,N-Dimethyl-2-(α-phenyl-o-toloxy)-ethylamine hydrochloride 351
Dimethyl phthalate .....(See under 1,1,1-Trichloro-2,2-bis(p-chlorophenyl)-ethane) 352 (O288)
1,8-Dimethylpicene O852
1,6-Dimethylpleiadene O626
4,9-Dimethyl-1',2',3',4'-tetrahydro-1,2-benzanthracene .....See 1',2',3',4'-Tetrahydro-4,9-dimethyl-1,2-benzanthracene
N,N-Dimethyl-N'-(2-thenyl)-N'-phenylethylenediamine hydrochloride 827
N,N-Dimethyl-N'-(3-thenyl)-N'-(2-pyridyl)-ethylenediamine hydrochloride 828
2',5'-Dimethyl-3',4',1,2-thiophenocarbazole 829
1,6-Dimethylthiopleiadene O1206
N-Dimethyl-m-toluidine 353
N-Dimethyl-o-toluidine 354
N-Dimethyl-p-toluidine 355
1,4-Dimethyltriphenylene O627
1,7-Dimethylxanthine 830
Dinaphthazine 831
2,3,8,9-Di-(1',2'-naphtho)-chrysene O936
Dinaphtho(2,1,1',2')furan O1207
β',β',β,α-Dinaphthofuran O1208
Dinaphthoperylene O937
Dinaphtho(2,1,1',2')thiophene O1209
α,α-Dinaphthyl O398
β,β-Dinaphthyl O399
9,10-Di-α-naphthylanthracene O468
α,α-Dinaphthylamine O400
β,β-Dinaphthylamine O401
Dinaphthylenedioxide O1210
β-Dinaphthyl ether O402
Di-2-naphthylethylene O403
2,4-Dinitroanisole 356
Dinitro-3,4-benzpyrene O853
3,5-Dinitro-o-cresol 357
4,6-Dinitro-o-cresol ..... See 3,5-Dinitro-o-cresol
3,5-Dinitro-o-cresol, sodium salt O290
2,4-Dinitro-1-napthol O404
2,4-Dinitrophenol 358
2,4-Dinitrophenol, sodium salt 359
2,4-Dinitrotoluene 360 (O291)
Dioctyl ester of sodium sulfosuccinate ..... See Aerosol-OT
Dioctyl sebacate 144
Dioxane O1211
3,5-Dioxo-1,2-diphenyl-4-n-butylpyrazolidine ..... See Butazolidine
Diphenyl 361 (O292)
Diphenylacetic acid O293
Diphenylamine O294
Diphenylamine-4,4'-bis(1''-azo-2''-hydroxy-5''-isohexylbenzene) 629
Diphenylaminochlorarsine O1212
9,10-Diphenylanthracene O469
9,10-Diphenyl-1,2-benzanthracene O628
Diphenylbenzidine O295
Diphenyl-bis(diazonium hydroxide) 630
Diphenylchlorarsine O296
5,6-Diphenylchrysene O629
Diphenylcyanarsine O297
10,10'-Diphenyl-9,9'-dianthryl O470
9,12,10,11-Diphenylene-9,10-diphenyl-9,10-dihydronaphthacene O938
bis-Diphenylene-ethylene O471
9,12,10,11-Diphenylenenaphthacene O939
Diphenylene oxide O1213
Diphenylethane O298

α,α-Diphenyl-β-ethyl-α-amylene ..... O299 and Add.
α,α-Diphenyl-β-ethyl-α-butylene ..... O300 and Add.
N,N-Diphenyl ethyl carbamate 362
Diphenylhexadiene O301
Diphenylhexane O302
α,α-Diphenyl-β-methyl-α-propylene..... O303 and Add.
Diphenyl-α-napthylcarbinol O405
1,1-Diphenyl-3-(N-piperidyl)-1-propanol hydrochloride 832
α-Diphenyl-β-trinitro phenylhydrazyl..... 363
Diphenylurethane.... See N,N-Diphenyl ethyl carbamate
p-Di-n-Propylaminoazobenzene O999
9,10-Di-n-propyl-1,2-benzanthracene O630
Dipropylene glycol..... O141
N,N-Di-n-propyl ethyl carbamate..... 145
N,N-Dipropyl succinamic acid ethyl ester..... 146
p-(Di-n-propylsulfamyl)-benzoic acid..... 364
Di-β-resorcylic-gallic acid..... 973
3,4-Disodium phenanthrene dicarboxylate .....
.....See Phenanthrene-3,4-dicarboxylic acid disodium salt
1,4-Distyrylbenzene..... O304 and Add.
Dodecahydro-1,2-benzanthracene O631,O632,O633
1,2,3,4,5,6,7,10,17,20,22,23-Dodecahydrocholanthrene..... O854
Dodecahydrotriphenylene O634
Dodecamethylpentasiloxane 147
Dodecylbenzene sodium sulfonate 365
Dodecyl gallate 366
Doisynolic acid 521
Dolophine..... O142
Edicol Amaranth AS..... O1000
Edicol Orange RS O1001
Edicol Ponceau RS..... O1002
Emcol 888.....See Polyalkyl naphthalene pyridinium chloride
Eosin 833 (O1214)
Ephedrine sulfate O305
Epinephrine..... See Adrenaline
Equilenin 710 (O1086)
Equilenin benzoate..... O1087
Equilin 711 (O1088)
Equilin benzoate..... 712 (O1089)
Ergosterol O1090
Ergotamine tartrate..... 834
Erythritol tetranitrate..... O143
Erythromycin 974
Erythrosine..... 835
Estradiol 713 (O1091)
Estradiol-3-acetate-17-benzoate..... O1092
Estradiol-3-acetate-17-propionate O1093
Estradiol benzoate..... 714 (O1094)
Estradiol-3-benzoate-17-acetate..... O1095
Estradiol-3-benzoate-17-n-butyrate O1096
Estradiol-17-benzoate-3-n-butyrate O1097
Estradiol-benzoate-butyrate..... O1098
Estradiol-3-benzoate-17-propionate O1099
Estradiol-3-benzoate-17-n-valerate O1100
Estradiol-3-n-butyrate-17-benzoate O1101
Estradiol-17-caprylate..... O1102
Estradiol caprylate..... O1103
Estradiol di-n-butyrate O1104
Estradiol dicaprate..... O1105
Estradiol di-n-hexanoate O1106
Estradiol di-isobutyrate O1107
Estradiol di-n-octanoate..... O1108
Estradiol dipalmitate O1109
Estradiol dipropionate..... O1110
Estradiol di-n-valerate O1111
Estradiol propionate 716
Estradiol-3-propionate-17-benzoate O1112
Estriol 717 (O1113)
Estrone 718 (O1114)
Estrone benzoate..... 719 (O1115)
Estrone n-hexanoate O1116
Estrone methyl ether O1117
Estrone n-octanoate..... O1118
Ether O144
Ethinylcyclohexyl carbamate 367
17-Ethinyl estradiol..... 720 (O1119)
Ethinyl testosterone..... 721 (O1120)
4-Ethoxybenzene-1-(4'-azo-1'-naphthol)..... 631
3'-Ethoxy-4-dimethylaminoazobenzene..... 632
10-Ethoxymethyl-1,2-benzanthracene..... O635
4-Ethoxyphenylurea 368
Ethyl acetate O145
Ethyl acrylate..... 148
Ethyl alcohol 149 (O146)
Ethylamine..... 150
N-Ethyl-p-aminoazobenzene..... 633
9-Ethylanthracene O472
5-Ethyl-1,2-benzanthracene O636
8-Ethyl-1,2-benzanthracene O637
10-Ethyl-1,2-benzanthracene..... O638
2-Ethyl-3,4-benzphenanthrene O639
Ethyl benzoate O306
5,5-Ethyl-n-butyl-barbituric acid, sodium salt O1215
Ethyl butyrate..... 151
Ethyl carbamate..... 152 (O147 and Add.)

20-Ethylcholanthrene O855
Ethyl cyanocyclohexyl acetate 369
N-Ethyl-3,4,5,6-dibenzcarbazole 836
5-Ethyl-7,8-dihydro-1,2-benzanthracene O640
17β-Ethyldihydrotestosterone 722
5-Ethyl-9,10-dimethyl-1,2-benzanthracene O641
Ethylene-bis-chloroethyl sulfide O148
N,N'-Ethylene-bis(ethyl carbamate) 153
Ethylene chlorohydrin 154
Ethylene dibromide 155
Ethylene dichloride 156
Ethylene glycol O149
Ethylene glycol diacetate O150
Ethylene glycol mono-n-butyl ether O151
Ethylene glycol monoethyl ether O152
Ethylene glycol monomethyl ether O153
Ethylene glycol monoisopropyl ether O154
Ethylene glycol mono-n-propyl ether O155
Ethyl epoxymethylphenylacrylate 837
2-Ethyl hexanediol-1,3 157
2-Ethylhexyl azelate 158
2-Ethylhexyl diphenyl phosphate 370
N,N'-Ethylidene-bis(ethyl carbamate) 159
6'-Ethyl-2,3,1',2'-indeno-4,5-benzoindole 838
5,5-Ethyl-isoamyl-barbituric acid, sodium salt O1216
5,5-Ethyl-isopropyl-barbituric acid, calcium salt ... O1217
5,5-Ethyl-isopropyl-barbituric acid, sodium salt O1218
p-Ethylmethylaminoazobenzene ..... See N-Methyl-N-ethyl-p-aminoazobenzene
5-Ethyl-5-(1-methyl-1-butenyl)-barbituric acid, sodium salt O1219
5,5-Ethyl-(1-methylbutyl)-barbituric acid, sodium salt O1220,O1267
5,5-Ethyl-(1-methylbutyl)-thiobarbituric acid, sodium salt O1221
Ethyl-1-methyl-4-phenylpiperidine-4-carboxylate hydrochloride ..... See Meperidine hydrochloride
Ethyl β-naphthylamine hydrochloride O406
Ethyl p-nitrophenyl thionobenzene phosphonate 371
Ethyl palmitate O156
5,5-Ethyl-phenylbarbituric acid, sodium salt O1222
5-Ethyl-5-phenylhexahydropyrimidine-4,6-dione 839
Ethyl phthalyl ethyl glycolate 372
α-Ethyl-β-sec-butylstilbene O307
Ethyl silicate ..... See Tetraethyl orthosilicate
Ethyl stearate O157
p-Ethylsulfonylbenzaldehyde thiosemicarbazone 373
5'-Ethyl-2',3',1,2-thiopheno-5,6-benzcarbazole 840
5'-Ethyl-2',3',1,2-thiopheno-7,8-benzcarbazole 841
Ethyl urethane ..... See Ethyl carbamate
Evans Blue 634
Fast Brown G O1003
Fast Green FCF 374
FD&C Blue I ..... See Brilliant Blue
FD&C Green I ..... See Guinea Green B.
FD&C Green II ..... See Light Green F.S.
FD&C Green III ..... See Fast Green FCF
FD&C Orange I ..... See Orange I
FD&C Orange 2 ..... See o-Tolylazo-β-naphthol
FD&C Red I ..... See Ponceau 3R
FD&C Red 2 ..... See Amaranth
FD&C Red 3 ..... See Erythrosine
FD&C Red 4 ..... See Ponceau SX
FD&C Red 32 ..... See Sudan II
FD&C Yellow 3 ..... See Phenylazo-2-naphthylamine
FD&C Yellow 4 .. See 1-o-Tolyazo-2-naphthylamine
FD&C Yellow 5 ..... See Tartrazine
FD&C Yellow 6 ..... See Sunset Yellow
Ferric chloride 35
Ferric citrate 160
Ferric dimethyldithiocarbamate 161
Ferrous ammonium sulfate 36
Ferrous sulfate 37
Fettponceau ..... See Scarlet Red
Fluoranthene O642
Fluorene 522 (O473)
Fluorenone O474
7-Fluoro-2-acetylaminofluorene 523
2-Fluoro-4-dimethylaminoazobenzene 635
2'-Fluoro-4-dimethylaminoazobenzene 636
3'-Fluoro-4-dimethylaminoazobenzene 637
4'-Fluoro-4-dimethylaminoazobenzene 638
2'-Fluoro-4-dimethylaminostilbene 375
4'-Fluoro-4-dimethylaminostilbene 376
Fluoroethyl carbamate 162
3-Fluortyrosine O308
Folliculin ..... See Estrone
Folliculin benzoate ..... See Estrone benzoate
Formaldehyde 163 (O158)
Formalin ..... See Formaldehyde
4-Formylaminoazobenzene 639
2-Formyl-3,4-benzphenanthrene O643
4-Formylmonomethylaminoazobenzene 640
Fructose O1225
Fuchsin, basic ..... See Basic Fuchsin
Fuchsine O309
Fumaric acid O159
Furfural O1226
Galactose 842 (O1227)
Gallium chloride 38

Gallium citrate 164
Gallium lactate 165
Gammexane.... See Benzene hexachloride, γ isomer
Gentian violet O310
Gentisic acid 377
Glucose 843 (O1228)
Glycerol 166 (O160)
Glycocholic acid O1121
Glycocyamine 167
Gold 39
Gold calcium thiomalate O24
Gold sodium thiosulfate O25
Gold sulfide O26
Gold thioglucose O27
Guaiacol 378
Guinea Green B 379
Hematoxylin 844 (O1229)
Heptachlor epoxide 845
1 or 3a,4,5,6,7,8,8-Heptachlor-3a,4,7,7a-tetrahydro-4,7-methanoindene epoxide ..... See Heptachlor epoxide
5-n-Heptyl-1,2-benzanthracene O644
Hexabromonaphthacene O645
Hexachlorocyclohexane... See Benzene hexachloride
Hexachloroepoxyoctahydro-endo-exodimethanonaphthalene ..... See Dieldrin
1,2,3,4,10,10-Hexachloro-1,4,4a,5,8,8a-hexahydro-1,4,5,8-dimethanonaphthalene 550
Hexacol Supra-Red 10B 641
Hexadiene ..... See 4,4'-Dihydroxy-β,δ-diphenyl-β,δ-hexadiene
1,2,3,4,11,14-Hexahydro-20-methylcholanthrene O856
Hexahydrophthalic acid diethyl ester 380
sym-Hexahydropyrene O647
unsym-Hexahydropyrene O648
Hexamethyldisiloxane 168
Hexamethylene-1,6-bis-trimethylammonium iodide. 170
Hexamethylenediamine 169
Hexamethylenetetramine O1230
4,4',4''-Hexamethyltriaminotriphenylmethane O311
Hexestrol (Hexoestrol) ..... See γ,δ-Di-(p-hydroxyphenyl)-hexane
5-n-Hexyl-1,2-benzanthracene O649
Hippuric acid O312
Histamine 846 (O1231)
Histamine dihydrochloride 847 (O1232)
Hydracrylic acid β-phenylethyl ester 381
Hydrazobenzene 642
"Hydrocarbon A" O1320
Hydrochloric acid 40 (O28)
Hydrodibenzpyrene ..... See 5, 10-Dihydro-3,4,8,9-dibenzpyrene
Hydrogen fluoride 41
Hydrogen peroxide 42
Hydrogen sulfide O30
Hydroquinone 382 (O313)
Hydroquinone dimethyl ether 383
Hydroquinone monomethyl ether 384
Hydroretene O475
7-Hydroxy-2-acetaminofluorene O476
4-Hydroxy-4-aminoazobenzene 643
3-Hydroxy-4-(p-aminophenylazo)-1,2-benzanthracene O1004
4-Hydroxyazobenzene 644 (O1005)
4-Hydroxy-2',3-azotoluene... See 4-Hydroxy-2,3'-azotoluene
4'-Hydroxy-2,3'-azotoluene O1006
3-Hydroxy-1,2-benzanthracene O650
4'-Hydroxy-1,2-benzanthracene O651
8-Hydroxy-1,2-benzanthracene O652
10-Hydroxy-1,2-benzanthracene O653
3-Hydroxy-1,2-benzanthracene benzoate O654
3-Hydroxy-1,2-benzanthracene stearate O655
4'-Hydroxybenzene-azo-2-fluorene 645
m-Hydroxybenzoic acid O314
p-Hydroxybenzoic acid 385 (O315)
2-Hydroxy-3,4-benzpyrene O857
4'-Hydroxy-3,4-benzpyrene O858
5-Hydroxy-3,4-benzpyrene O859
6-Hydroxy-3,4-benzpyrene O860
8-Hydroxy-3,4-benzpyrene 573 (O861)
4'-Hydroxy-3,4-benzpyrene acetate O862
4'-Hydroxy-3,4-benzpyrene p-aminobenzoate O863
β-Hydroxybutyric acid, sodium salt 171
p-Hydroxybutyrophenone 386
1-Hydroxychrysene O656
3-Hydroxychrysene O657
4-Hydroxychrysene O658
6-Hydroxychrysene O659
x-Hydroxychrysene O660
17-Hydroxycorticosterone 723
9-Hydroxy-1,2,5,6-dibenzanthracene O864
4-Hydroxydibenzyl O316
2-Hydroxy-4-dimethylaminoazobenzene 646
2'-Hydroxy-4-dimethylaminoazobenzene 647
3'-Hydroxy-4-dimethylaminoazobenzene 648
4'-Hydroxy-2,3'-dimethylazobenzene ..... See 4'-Hydroxy-2,3'-azotoluene
4'-Hydroxy-4-dimethylaminoazobenzene 649
4-Hydroxydiphenylamine O317

4-β-Hydroxyethylmethylaminoazobenzene 650
Hydroxyestrin benzoate ..... See Estradiol benzoate
α-Hydroxy-10-ethyl-1,2-benzanthracene O661
10-β-Hydroxyethyl-1,2-benzanthracene O662
1-(2-Hydroxyethylcarbamylmethyl)-pyridinium chloride, lauric ester O1233
Hydroxylamine 43
o-(N-γ-Hydroxymercuri-β-hydroxyethoxypropyl-carbamyl)-phenoxyacetic acid, sodium salt 387
2-[(3'-Hydroxymercuri-2'-methoxypropyl)-carbamyl]-phenoxyacetic acid 388
1-(2'-Hydroxymercuri-3'-methoxypropyl)-3-succinylurea and theophylline ..... See Meralluride
3-Hydroxy-10-methyl-1,2-benzanthracene O663
10-Hydroxymethyl-1,2-benzanthracene O664
2-Hydroxy-20-methylcholanthrene O865
3-Hydroxy-20-methylcholanthrene O866
15-Hydroxy-20-methylcholanthrene O867
7-Hydroxy-4-methylcoumarin diethoxythiophosphoric acid ester 848
4'-Hydroxy-4-monomethylaminoazobenzene 651
3-Hydroxy-2-phenylcinchoninic acid 849
4-Hydroxyphenylglycine O318
Hydroxyphenthiazone O1234
p-Hydroxypropenylbenzene O319
p-Hydroxypropiophenone 389
p-Hydroxypropiophenone propionate 390
2-Hydroxypropyl trimethylammonium bromide acetate 172
x-Hydroxypyrene O665
3-Hydroxypyrene-5,8,10-trisulfonic acid, sodium salt O666
4-Hydroxystilbene O320
5-Hydroxytryptamine 850
Igepal CA 391
Indalone ..... See α,α-Dimethyl-α'-carbobutoxydihydro-γ-pyrone
Indium O31
Indium chloride O32
Indium sulfate O33
Indole 851 (O1235)
Indole-3-acetic acid O1236
γ-(Indole-3)-n-butyric acid O1237
β-(Indole-3)-propionic acid O1238
2,9(N)-Indoloanthrone O1239
Indophenol O321
Inositol O322
Insulin O1321
Intégerrimine O1322
Iodine O34
Iodoacetic acid O161
Iron oxide O35
Isoamyl carbamate ..... O162 and Add.
d-Isoascorbic acid O1240
d-Isoascorbyl palmitate O1241
Iso-naphthathioxine O1242
Isoniazid ..... See Isonicotinic acid hydrazide
Isonicotinic acid hydrazide 852
Isonicotinoyl hydrazide ..... See Isonicotinic acid hydrazide
1-Isonicotinyl-2-isopropyl hydrazine 853
Isopropanol 173
7-Isopropenyl-1,2-benzanthracene dimer O667
10-Isopropenyl-3,4-benzpyrene O868
1-Isopropenylnaphthalene, dimer O407
3-Isopropyl-1,2-benzanthracene O668
5-Isopropyl-1,2-benzanthracene O669
6-Isopropyl-1,2-benzanthracene O670
7-Isopropyl-1,2-benzanthracene O671
8-Isopropyl-1,2-benzanthracene O672
10-Isopropyl-1,2-benzanthracene O673
6-Isopropyl-2,3-benzanthracene ..... See β-Isopropylnaphthacene
1-Isopropyl-3,4-benzphenanthrene O674
2-Isopropyl-3,4-benzphenanthrene O675
Isopropyl carbamate 174 (O1332)
20-Isopropylcholanthrene O869
2-Isopropylchrysene O676
Isopropyl cinnamate 392
Isopropyl citrate 175
N-Isopropyl ethyl carbamate 176
2-Isopropyl-8-methyl-3,4-benzphenanthrene .... See 10-Methyl-3'-isopropyl-1,2-benzanthracene
β-Isopropylnaphthacene O677
Isopropylnaphthalene sodium sulfonate 465
Isopropyl-N-phenyl carbamate 393
p-Isopropylphenylethyl alcohol 394
10-Isothiocyanomethyl-1,2-benzanthracene O678
Jacobine O1323
Janus Green 854
3-Keto-aetio-allocholanol-17 .... See Dihydroandrosterone
12-Keto-18,19-bisnorcholanic acid O1122
12-Ketocholadienic acid O1123
1-Ketocholanthrene ..... See 15-Ketocholanthrene
15-Ketocholanthrene O870
7-Ketocholesterol 724
Ketoestrin benzoate ..... See Estrone benzoate
Ketohydroxyoestrin ..... See Estrone

Ketohydroxyoestrin benzoate . See Estrone benzoate
Ketohydroxyoestrone benzoate ..... See Estrone benzoate
Ketomethoxyoestrin ..... See Estrone methyl ether
15-Keto-20-methylcholanthrene O871
1-Keto-octahydroanthracene..... O477
4'-Keto-1',2',3',4'-tetrahydro-3,4-benzpyrene..... O872
1-Keto-1,2,3,4-tetrahydrophenanthrene O478
Lactic acid..... 177 (O163)
Lactose 855 (O1243)
Lanthanum acetate..... 44
Lauric acid O164
Lauryl diethylenetriamine..... O165
Lauryl gallate..... See Dodecyl gallate
Lead O36
Lead acetate..... 45 (O37)
Lead acetate, basic..... 46 (O38)
Lead arsenate..... O39
Lead azide O40
Lead carbonate O41
Lead chloride 47 (O42)
Lead iodide O43
Lead nitrate 48 (O44)
Lead sulfide 49 (O45)
Lecithin..... O166
Leuco neutral red..... O1244
Light Green F.S. 395 (O323)
Light Green SF yellowish..... See Light Green F.S.
Lithium carmine O479
Lithium chloride 50
Longilobine O1324
Lucite ..... See Methyl methacrylate polymer
Luminal..... O1245
Luteogan..... See Progesterone
Luteosterone ..... See Progesterone
Magnamycin 975
Magnamycin hydrochloride..... 976
Malathion..... 178
Maleic acid, sodium salt..... O167
Manganese O46
Mannitol O168
Mannitol hexanitrate O169
Mannose O1246
Marsalid.. See 1-Isonicotinyl-2-isopropyl hydrazine
Martius Yellow ..... See 2,4-Dinitro-1-naphthol
Menadiol.... See 2-Methyl-1,4-naphthohydroquinone
Menformone ..... See Estrone
Meperidine hydrochloride 856
Meralluride..... 179
2'-Mercaptomethyl-1,2,5,6-dibenzcarbazole..... 857
2'-Mercaptomethyl-1,2,7,8-dibenzcarbazole..... 858
Mercuric acetate..... 51
Mercury 52
Mersalyl-theophylline ..... See 2-[(3'-Hydroxymercuri-2'-methoxypropyl)-carbamyl] -phenoxyacetic acid
meso-Dihydro-3-methylcholanthrene ..... See meso-Dihydro-20-methylcholanthrene
Mesothorium O47
Metanil Yellow YKS O1008
Metanitrazoline..... See m-Nitrophenylazo-β-naphthol
3-Methoxy-1,2-benzanthracene O679
4'-Methoxy-1,2-benzanthracene O680
10-Methoxy-1,2-benzanthracene..... O681
2'-Methoxybenzene-azo-2-naphthol..... 652
4'-Methoxy-3,4-benzpyrene..... O873
8-Methoxy-3,4-benzpyrene..... 574
p-Methoxybenzyl alcohol..... 396
1-Methoxychrysene..... O682
2-Methoxychrysene..... O683
3-Methoxychrysene..... O684
4-Methoxychrysene..... O685
6-Methoxychrysene..... O686
9-Methoxy-1,2,5,6-dibenzanthracene..... O874
2'-Methoxy-1,2,5,6-dibenzcarbazole 859
2'-Methoxy-1,2,7,8-dibenzcarbazole 860
4'-Methoxy-9,10-dimethyl-1,2-benzanthracene O687
3-Methoxy-10-ethyl-1,2-benzanthracene..... O688
Methoxyethyl oleate 180
8-(2'-Methoxy-3'-hydroxymercuripropyl)-coumarin-3-carboxylic acid theophylline... See Cumertilin
3-Methoxy-10-methyl-1,2-benzanthracene O689
5-Methoxy-10-methyl-1,2-benzanthrancene..... O690
10-Methoxymethyl-1,2-benzanthracene..... O691
2-Methoxy-20-methylcholanthrene..... O875
3-Methoxy-20-methylcholanthrene..... O876
1-(p-Methoxyphenyl)-2-methyl-1,3-propanediol methylene ether..... 397
3-Methoxy-10-propyl-1,2-benzanthracene..... O692
2-Methoxy-1,2,3,4-tetrahydronaphthalene 466
7-Methyl-8,9-ace-1,2-benzanthracene..... O877
2-Methyl-4-acetylaminobiphenyl 398
9-Methylacridine..... O1247
Methyl alcohol O170
4'-Methyl-4-aminoazobenzene O1009
N-Methyl-p-aminoazobenzene..... O1010
3-Methylamino-1,2-benzanthracene O693
17-Methyl androstanediol-3α,17α..... O1124
17-Methyl androstanediol-3β,17α..... O1125

17-Methyl Δ^5-androstenediol-3β,17α O1126
2-Methylanthracene O480
9-Methylanthracene O481
Methylanthracene O482
2-Methyl-5,6-benzacridine 861
3-Methyl-5,6-benzacridine 862 (O1248)
2-Methyl-7,8-benzacridine 863
4-Methyl-7,8-benzacridine 864
7-Methyl-1,2-benzacridine ..... See 3-Methyl-5,6-benzacridine
9-Methyl-3,4-benzacridine O1249
7-Methyl-3,4-benzacridine O1250
1'-Methyl-1,2-benzanthracene O694
2'-Methyl-1,2-benzanthracene 551 (O695)
3-Methyl-1,2-benzanthracene O696
3'-Methyl-1,2-benzanthracene O697
4-Methyl-1,2-benzanthracene O698
4'-Methyl-1,2-benzanthracene O699
5-Methyl-1,2-benzanthracene O700
6-Methyl-1,2-benzanthracene O701
7-Methyl-1,2-benzanthracene 552 (O702)
8-Methyl-1,2-benzanthracene 553 (O703)
9-Methyl-1,2-benzanthracene O704
10-Methyl-1,2-benzanthracene 554 (O705)
10-Methyl-1,2-benzanthracene-5-carbonamide O706
10-Methyl-1,2-benzanthracene-6-carboxylic acid O707
10-Methyl-1,2-benzanthracene-7-carboxylic acid O708
9-Methyl-1,2-benzanthryl-10-acetic acid O709
10-Methyl-1,2-benzanthryl-3-isocyanate O710
6-Methyl-3,4-benzcarbazole 865
9-Methyl-1,2-benzocarbazole O1251
6'-Methyl-4,5-benzo-2,3,1',2'-indenoindole 866
2-Methyl-7,8-benzophenothiazine O1252
3-Methyl-5,6-benzo-9-phenylflavin O1253
1-Methyl-3,4-benzphenanthrene O711
2-Methyl-3,4-benzphenanthrene O712
6-Methyl-3,4-benzphenanthrene O713
7-Methyl-3,4-benzphenanthrene O714
8-Methyl-3,4-benzphenanthrene O715
6-Methyl-3,4-benzphenanthrene-10-carboxylic acid, sodium salt O716
3'-Methyl-3,4-benzpyrene O878
4'-Methyl-3,4-benzpyrene O879
5-Methyl-3,4-benzpyrene O880
6-Methyl-3,4-benzpyrene O881
9-Methyl-3,4-benzpyrene O882
Methylcellulose O1254
Methyl bis(β-chloroethyl)amine 185 (O171)
Methyl bis(β-chloroethyl)amine hydrochloride 186
1-Methyl bisdehydrodoisynolic acid 524
7-Methyl bisdehydrodoisynolic acid ..... See Bisdehydrodoisynolic acid 7-methyl ether
4-Methyl-5-n-butyl-thiouracil 867
Methyl carbamate O1333
N-Methyl-N'-(4-chlorobenzhydryl)-piperazine dihydrochloride 868
3-Methylcholanthrene ... See 20-Methylcholanthrene
4-Methylcholanthrene ... See 22-Methylcholanthrene
5-Methylcholanthrene ... See 23-Methylcholanthrene
20-Methylcholanthrene ..... 575 (O883 and Add.)
22-Methylcholanthrene O884
23-Methylcholanthrene O885
20-Methylcholanthrene choleic acid O886
20-Methylcholanthrene-endo-α,β-succinic acid, sodium salt O888
3-Methylcholanthrene-endo-α,β-succinylglycine ethyl ester ... See 20-Methylcholanthrene-endo-α,β-succinylglycine ethyl ester
20-Methylcholanthrene-endo-α,β-succinylglycine ethyl ester O889
20-Methylcholanthrene picrate O887
20-Methylcholanthrene-sulfonic acid O890
20-Methylcholanthrene-trinitrobenzene O891
1-Methyl chrysene 555
4-Methyl chrysene O717
5-Methyl chrysene O718
6-Methyl chrysene O719
9-Methyl-10-cyano-1,2-benzanthracene O720
3'-Methyl-1,2-cyclopentenophenanthrene (Diels hydrocarbon) O721
3-Methylcyclopenenophenanthrene 556
3'-Methylcyclopentenophenanthrene 557
4-Methylcyclopentenophenanthrene 558
5-Methylcyclopenenophenanthrene 559
6-Methylcyclopentenophenanthrene 560
8-Methylcyclopenenophenanthrene 561
9-Methylcyclopentenophenanthrene 562 (O722)
10-Methylcyclopentenophenanthrene 563
5-Methyl-2,4-diaminoazobenzene O1011
5'-Methyl-2'4'-diaminobenzene-azo-2-fluorene 654
3'-Methyl-1, 2,5,6-dibenzacridine O1255
9-Methyl-1,2,7,8-dibenzacridine O1256
2'-Methyl-1,2,5,6-dibenzanthracene O892
3'-Methyl-1,2,5,6-dibenzanthracene O893
4-Methyl-1,2,5,6-dibenzanthracene O894
9-Methyl-1,2,5,6-dibenzanthracene O895
N-Methyl-3,4,5,6-dibenzcarbazole O1257
2'-Methyl-1,2,5,6-dibenzcarbazole 869
9-Methyl-1,2,5,6-dibenzfluorene O896
9-Methyl-1,2,7,8-dibenzfluorene O897

9-Methyl-1,2,3,4-dibenzophenanthrene O898
10-Methyl-1,2,3,4-dibenzophenanthrene..... O899
7-Methyl-1,2,3,4-dibenzpyrene O940
5-Methyl-1',2',2,3-dibenzthiophenoindole..... 870
1-Methyl-4-β-diethylaminoethylaminothioxanthone hydrochloride..... 871
5-Methyl-7,8-dihydro-1,2-benzanthracene ..... See 7,8-Dihydro-5-methyl-1,2-benzanthracene
2'-Methyl-3,4-dihydro-1,2,5,6-dibenzcarbazole 872
2-Methyl-4-dimethylaminoazobenzene..... 655 (O1012)
2'-Methyl-4-dimethylaminoazobenzene..... 656 (O1013)
3-Methyl-4-dimethylaminoazobenzene..... 657
3'-Methyl-4-dimethylaminoazobenzene..... 658 (O1014)
4'-Methyl-4-dimethylaminoazobenzene..... 659 (O1015)
2-Methyl-4-dimethylaminoazobenzene hydrochloride O1016
1',9-Methylene-1,2-benzanthracene O900
1',9-Methylene-1,2-benz-10-anthranol O901
N,N-Methylene-bis (ethyl carbamate)..... 187
Methylene Blue 873
4,5-Methylenechrysene..... O902
1',9-Methylene-1,2,5,6-dibenzanthracene..... O941
9-Methyl-10-ethoxymethyl-1,2-benzanthracene..... O723
N-Methyl-N-ethyl-p-aminoazobenzene 660 (O1017)
N-Methyl-2'-ethyl-p-aminoazobenzene..... 661
N-Methyl-4'-ethyl-p-aminoazobenzene..... 662
3-Methyl-10-ethyl-7,8-benzacridine 874
5-Methyl-9-ethyl-3,4-benzacridine..... O1258
7-Methyl-9-ethyl-3,4-benzacridine..... O1259
9-Methyl-10-ethyl-1,2-benzanthracene..... O724
N-Methyl ethyl carbamate..... 188
Methyl ethyl ketone..... O172
3-Methyl-5,5-ethylphenylbarbituric acid, sodium salt O1223
1-Methyl-3-ethyl-4-phenyl-4-propionoxypiperidine hydrochloride..... 875
Methyl gallate..... 400
Methyl Green..... 401
17α-Methyl-D-homoandrostane 732
Methyl Iodide..... 189
Methyl isobutyl carbinol azelate..... 190
10-Methyl-3'-isopropyl-1,2-benzanthracene..... 725
5-Methyl-8-isopropyl-2',1'-naphtho-1,2-fluorene.... O903
1-Methyl-3-isopropyl-phenanthrene..... O483
Methyl methacrylate polymer 191
3-Methyl-4-methoxyacetophenone..... 402
N-Methyl-2'-methyl-p-aminoazobenzene 663 (O1018)
N-Methyl-3-methyl-p-aminoazobenzene 664
N-Methyl-3'-methyl-p-aminoazobenzene 665 (O1019)
N-Methyl-4'-methyl-p-aminoazobenzene 666 (O1020)
3-Methyl-5,5-methylcyclohexenylbarbituric acid, sodium salt..... O1224
10-Methyl-1',9-methylene-1,2-benzanthracene O904
β-Methylnaphthalene 467
8-Methyl-2',1'-naphtho-1,2-fluorene..... O905
2-Methyl-1,4-naphthohydroquinone O408
2-Methyl-1,2-naphthohydroquinone diacetate O409
2-Methyl-1,4-naphthohydroquine di-n-butyrate O410
2-Methyl-1,4-naphthohydroquinone dipropionate..... O411
2-Methyl-1,4-naphthoquinone..... O412
6-Methyl-2'-nitro-1,2-benzcarbazole..... 876
Methyl Orange O1021
2-Methyl-9-phenyl-2,3-dihydro-1-pyridindene hydrobromide..... 877
2-Methyl-9-phenyl-2,3,4,4a,9,9a-hexahydro-1-pyridindene hydrobromide 878
Methylphenylsilicone..... 403
2-Methyl-9-phenyl-2,3,4,9-tetrahydro-1-pyridindene hydrochloride..... 879
3-(2'-Methylpiperidyl-(N)-methyl)-indole 880
Methylpolysiloxane 192
4-Methylpyrene..... O726
Methyl Red..... 667 (O1022)
Methyl salicylate..... O324
α-Methylstilbene O325
17-Methyltestosterone..... 733 (O1127)
9-Methyl-10-thiocyano-1,2-benzanthracene..... O727
5'-Methyl-3',2',1,2-thiopheno-5,6-benzcarbazole 881
5'-Methyl-3',2',1,2-thiopheno-7,8-benzcarbazole 882
4-Methyl-2-thiouracil 883 (O1260)
Methyltransandrostenediol ..... See 17α-Methyl Δ5-androstene-3β,17β-diol
1-Methyltriphenylene O728
Metrazole O1261
Michler's ketone..... See Tetramethyl-1,1'-diaminobenzophenone
Miricil D..... See 1-Methyl-4-β-diethylaminoethylaminothioxanthone hydrochloride
Mispickel..... See Arsenopyrite
Monobutylphenyl-phenol sodium monosulfonate 404
Monochloracetone..... See Chloracetone
Monocrotaline..... O1325
Monoethylamine ..... See Ethylamine
N-Monomethyl-2-aminofluorene..... 525
N-Monomethylaniline 405
Mono-N-methylanilinehydrochloride 406
Morphine sulfate 884
Morpholylethylmorphine 885

Mustard gas..... See β,β'-Dichlorodiethyl sulfide
Mustard oil..... See Allyl isothiocyanate
Myleran..... See 4,4-Dimethane sulphonoxy butane
Myristic acid..... O173
Myristyl-γ-picolinium chloride..... O1262
Naphthacene..... O729
Naphthalene..... 468 (O413)
1-Naphthaleneazo-2',4'-diaminobenzene..... 668
Naphthalene fast orange 2 GS..... O1023
Naphthalene-β-sulfonyl chloride..... 469
1,2-(1',2'-Naphth)-anthracene..... O906
2',3'-Naphth-1,2-anthracene..... O907
Naphthion red..... O1024
α-Naphthoic acid..... 470
β-Naphthoic acid..... 470 (O414)
1',2'-Naphtho-2,3-fluorene..... O908
2',3'-Naphtho-2,3-fluorene..... O909
α-Naphthol..... O415
β-Naphthol..... 472 (O416)
Naphthol black P..... O1025
Naphtho-(1,2-f)-quinoline..... O1263
Naphtho-(1,2-g)-quinoline..... O1264
Naphtho-(2,1-f)-quinoline..... O1265
β-Naphthoquinoline..... See 5,6-Benzoquinoline
Naphtho-(1,2-f)-quinoline methoidide..... O1266
α-Naphthoquinone..... O417
β-Naphthoquinone..... O418
2',3'-Naphtho-1,2-phenanthrene..... O910
2',3'-Naphtho-2,3-phenanthrene..... O911
2',3'-Naphtho-3,4-pyrene..... O942
Naphthoylbenzoic acid..... O419
α-Naphthyl acetate..... 473
β-Naphthyl acetate..... 474
1-Naphthylacetic acid..... 475
α-Naphthylamine..... 476 (O420)
β-Naphthylamine..... 477 (O421)
β-Naphthylamine hydrochloride..... O422
α-Naphthyl benzoate..... 478
β-Naphthyl benzoate..... 479
β-Naphthyl ethyl ether..... 480
α-Naphthyl isothiocyanate..... 481
α-Naphthyl methyl ether..... 482
β-Naphthyl methyl ether..... 483
β-Naphthyl salicylate..... 484
α-Naphthyl thiourea..... O423
Nembutal..... See 5,5-Ethyl-(1-methylbutyl)-barbituric acid, sodium salt
Neo-antergan..... 886
Neoarsphenamine..... 407 (O326)
Neosalvarsan..... See Neoarsphenamine
Neoergosterol..... O1128
Neutral Red..... 887 (1268)
Neutral Violet..... 888
Nickel..... 53 (O48)
Nickel carbonate..... 54
Nickel carbonyl..... 55
Nicotinamide..... 889
Nicotine..... O1269
Nitric acid..... O49
10-Nitro-1,2-benzanthracene..... O730
4-Nitrobenzeneazo-4'-diphenylamine..... 669
m-Nitrobenzoic acid..... O327
p-Nitrobenzoic acid ethyl ester..... 408
4-Nitro-o-benzoquinone furazan..... 890
4-Nitro-o-benzoquinone furoxan..... 891
5-Nitro-3,4-benzpyrene..... O912
x-Nitrochrysene..... O731
9-Nitro-1,2,5,6-dibenzanthracene..... O913
2'-Nitro-1,2,7,8-dibenzcarbazole..... 892
2'-Nitro-4-dimethylaminoazobenzene..... 670
3'-Nitro-4-dimethylaminoazobenzene..... 671
4'-Nitro-4-dimethylaminoazobenzene..... 672
o-Nitrodiphenyl..... O328
2-Nitro-2-ethyl-1,3-propanediol butyraldehyde acetal..... 893
2-Nitrofluorene..... 526 (O484 and Add.)
5-Nitro-2-furaldehyde-2-(2-hydroxyethyl)-semicarbazone..... 894
Nitrogen mustard.... See Methyl(bis-β-chlorethylamine)
3-Nitro-4-hydroxyphenylarsonic acid..... 409
2-Nitro-2-methyl-1,3-propanediol..... 193
m-Nitrophenylazo-β-naphthol..... O1026
p-Nitrophenyl diethylthiophosphate..... 410
2-Nitropropane..... 194
x-Nitropyrene..... O732
p-Nitrosodimethylaniline..... O329
1,2,4,5,6,7,8,8-Octachloro-4,7-methano-3a,4,7,7a-tetrahydroindan..... 527
Octadecene nitrile..... 195
N-(9-octadecenoyl)-N-methyl taurate, sodium salt..... 196
Octahydroanthracene..... O485
Octahydro-1,2,5,6-dibenzanthracene..... O914
Octahydrophenanthrene..... O486
Octamethyl pyrophosphoramide..... 197
Octyl gallate..... 411
Oestr-..... See under estr-
Oestrin..... See Estrone
Oestroform-β..... See Estrone benzoate
Oil Orange E..... See Sudan I

Oil Yellow HA 977
Oleic acid O174
Oleyl-polyoxyethylene glycol ether 198
Olivine O50
Orange I (Edicol orange IS) 673 (O1001)
Orange II O1027
Orange SS ..... See o-Tolylazo-β-naphthol
Osmium tetraoxide 56
Ouabain O1129
Oxalyl-o-aminoazotoluene O1028
4'-Oxalyamino-2,3'-dimethylazobenzene ..... See Oxalyl-o-aminoazotoluene
4,10-Oxalyl-1,2-benzanthracene O915
Oxynone ..... See 2,4-Diaminodiphenylamine
Oxytetracycline 564
Palmitic acid O175
Paludrine O330
Pantoyltaurine O176
Paraldehyde O1270
Patent Blue V 412
Penicillin ..... See also 9-Aminoacridine penicillin
Benzylpenicillin-β-diethylaminoethyl ester hydriodide
N,N'-Dibenzylethylenediamine penicillin
Penicillin G
Procaine-penicillin G
Penicillin G 895
Pentacene O916
Pentachlorophenol O331
Pentaerythritol tetranitrate O177
2',3',4',5',6'-Pentamethyl-4-aminoazobenzene O1029
Pentamethylene dipropionate ..... See 1,5-Pentanediol dipropionate
1,5-Pentanediol diproprionate 199
Pentaphenylethane O332
Pentasol azelate 200
Pentobarbital ..... See 5,5-Ethyl-(1-methylbutyl)-barbituric acid, sodium salt
Perbenzoic acid 413
Perhydrochrysene O733
Perylene O917
Phemerol O333
Phenacetin 414
Phenanthra-acenaphthene O943
2',3'-Phenanthra-1,2-anthracene O944
Phenanthrafluorene O945
2',3'-Phenanthra-2,3-phenanthrene O946
Phenanthrene 528 (O487)
Penanthrene choleic acid O488
Phenanthrene-3,4-dicarboxylic acid O489
Phenanthrene-3,4-dicarboxylic acid, sodium salt O490
Phenanthrene-1,2-dicarboxylic anhydride O491
Phenanthrenequinone O492
Phenobarbitone ..... See Luminal
Phenocycline ..... See 1-Methyl bisdehydro-doisynolic acid
Phenothiazine O1271
9-Phenothiazone O1272
2-Phenoxyethyl acetate 415
Phenylacetic acid O334
Phenylacetylurea 416
dl-Phenylalanine O335
1-Phenylanthracene O493
2-Phenylanthracene O494
9-Phenylanthracene O495
Phenylazo-2-naphthylamine 674 (O1030)
3-Phenyl-5,6-benzacridine 896
3-Phenyl-7,8-benzacridine 897
5-Phenyl-1,2-benzanthracene O735
6-Phenyl-1,2-benzanthracene O736
9-Phenyl-10-carbomethoxyanthracene O496
9-Phenyl-10-carboxyanthracene O497
2-Phenylcyclohexanol 417
5-Phenyl-1,2,3,4-dibenzpyrene O947
1-Phenyl-3,4-dihydro-8,9-acephenanthrene O737
4'-Phenyl-4-dimethylaminoazobenzene 675
m-Phenylenediamine O336
o-Phenylenediamine O337
p-Phenylenediamine O338
2-Phenylethyl-α-hydroxyisobutyrate 418
9-Phenylflavin O1274
Phenylglycine O339
Phenylhydrazine 419
Phenylisocrotonic acid O340
Phenylmercuric acetate 420
Phenylmercuric dinaphthylmethane disulphonate 485
1-Phenyl-2-(methylamino)-propane 421
3-Phenyl-10-methyl-5,6-benzacridine 898
3-Phenyl-10-methyl-7,8-benzacridine 899
α-Phenylnaphthalene O424
Phenyl-α-naphthylamine 486 (O425)
Phenyl-β-naphthylamine 487 (O426)
9-Phenyl-10-α-naphthylanthracene O498
o-Phenylphenol 422
9-Phenyl-10-(phenyl-9'-anthranyl)-anthracene ..... See 10,10'-Diphenyl-9,9'-dianthryl
Phenylpropionic acid O341
Phenylthiocarbamide O342
Phloxine 900
Phosphorus O51

Phosphorus (white or yellow) 57 (O52)
Phthalic acid O343
Phthalylsulfathiazole O1275
Phthiocol O427
Picene O918
Picric acid O344
Pigment Bordeaux N O1031
1-(N-Piperidyl)-6-methyl-3-phenyl-3-heptanol hydrochloride 901
1-(N-Piperidyl)-4-methyl-3-phenyl-3-pentanol hydrochloride 902
3-(N-Piperidyl)-1-phenyl-1-cyclohexyl-1-propanol hydrochloride 903
1-(N-Piperidyl)-3-phenyl-3-heptanol hydrochloride. 904
1-(N-Piperidyl)-3-phenyl-3-hexanol hydrochloride.. 905
10-Piperonyl butoxide ..... See Piperonyl ether butoxide
10-Piperonyl-9,10-dihydro-1,2,7,8-dibenzacridine .. O1276
Piperonyl ether butoxide 906
Pitchblende ..... See Uraninite
Platinum 58
Platyphylline O1326
Plutonium O53
Polonium O54
Polyacenaphthylene O499
Polyalkyl naphthalene pyridinium chloride 488
Polyethylene 201
Polyethylene glycol 202
Polyethyleneglycol monoisooctylphenol ether 423
Polyoxyethylene monolaurate 203
Polyoxyethylene monostearate 204
Polyoxyethylene sorbitan monolaurate 907
Polyoxyethylene sorbitan monostearate 908
Polystyrene 424
Polyvinyl alcohol O178
Polyvinyl pyrrolidone 909
Ponceau 3R 676
Ponceau G ..... See Naphthalene fast orange 2GS
Ponceau 4GB O1032
Ponceau 2R ..... See Edicol Ponceau RS
Ponceau SX 677
Ponceau xylidine 678
Potassium acid phthalate O345
Potassium acid saccharate 205 (O179)
Potassium acid tartrate 206
Potassium p-aminobenzoate 425
Potassium arsenite O55
Potassium dicarboxybenzanthracene-dicarboxylic acid
Potassium dichromate 59
Potassium hydroxide O56
Potassium picrate O346
Potassium thiocyanate 60 (O57)
Pregnanediol O1130
Procaine-penicillin G 910
Progesterone 734 (O1131)
Progestin ..... See Progesterone
Progynon ..... See Estrone
Progynon B ..... See Estradiol benzoate
Progynon C ..... See 17-Ethinylestradiol
Prolan O1327
ℓ-Proline O1277
Promin O347
Prontosil O1033
Prontosil soluble O1034
p-Propenylphenol ..... See p-Hydroxypropenylbenzene
β-Propiolactone 911
Propionaldehyde O180
1-Propoxy-2-acetamido-4-nitrobenzene 426
1-n-Propoxy-2-amino-4-nitrobenzene 427
p-(n-Propoxy)-benzaldehyde 428
Propyl alcohol O181
9-n-Propyl-3,4-benzacridine O1278
5-n-Propyl-1,2-benzanthracene O738
10-n-Propyl-1,2-benzanthracene O739
2-n-Propyl-3,4-benzphenanthrene O740
Propyl carbamate 207 (O182)
N-Propyl cinnamate 429
5-n-Propyl-9,10-dimethyl-1,2-benzanthracene O741
Propylene dichloride 208
Propylene glycol O183
Propyleneglycol dipropionate 209
N-n-Propyl ethyl carbamate 210
Propyl gallate 430
6-n-Propyl-2-thiouracil 912 (O1279)
Putrescine 211
Pyribenzamine 913
Pyridine 914 (O1280)
Pyridine citrate 915
Pyridine-3-diethylcarbonamide 916
1,2(N)-Pyridinoanthracene ..... See β-Anthraquinoline
1,2(N)-Pyridinoanthracene methiodide ..... See β-Anthraquinoline methiodide
3(N),4-Pyridinophenanthrene ..... See Naphtho(1,2-f)-quinoline
3(N),4-Pyridinophenanthrene methiodide ..... See Naphtho(1,2-f)-quinoline
3(N),4-Pyridinopyrene O1281
N-(2-Pyridyl)-N-(2-thenyl)-N',N'-dimethylethylene-diamine 917

Pyrogallic acid ..... See Pyrogallol
Pyrogallol O348
Pyromucic acid O1282
Pyronine 918
Pyrrole O1283
β-Pyrrolidine-ethyl-phenothiazine 919

Quartz ..... See Silicon dioxide
d-Quartz O58
ℓ-Quartz O59
Quaterphenyl ..... See Benzerythrene
Quercetin 920
Quercitrin 921
Quinacrine ..... See Atabrine
Quinine 922

Radium O60
Radium bromide O61
Radium chloride O62
Radium sulfate O63
Radon O64
Resorcinol 431
Retene O500
Rhodamine B 923
Ricinoleic acid O184
Rimifon ..... See Isonicotinic acid hydrazide
Roccal ..... See Alkyldimethyl benzyl ammonium chloride
Rotenone O1284
Rubrene ..... See 9,10,11,12-Tetraphenylnaphthacene
Rutin O1285
Saccharin 924
Safranine 925
Salicylamide 432 (O349)
Salicylic acid 433 (O350)
Salvarsan ..... See Arsphenamine
Sarsasapogenin O1132
Scarlet R ..... See Scarlet Red
Scarlet Red 679 (O1035)
Scharlach R ..... See Scarlet Red
Scillaren O1133
Selenium 61
Seneciphylline O1328
Selenium ..... See Ammonium potassium selenide
dl-Serine O185
Silicon dioxide 62 (O65)
Silver 63 (O66)
Silver nitrate O67

Skatole O1286
Sodium acetate 64 (O68)
Sodium alkyl aryl sulfonate 434
Sodium alurate O1287
Sodium p-aminobenzoate 435
Sodium ammonium phosphate 65
Sodium arsenite 66 (O69)
Sodium azide O70
Sodium benzoate O351
Sodium bicarbonate O71
Sodium bisulfite O72
Sodium chloride 67 (O73)
Sodium cyclohexyl sulfamate 436
Sodium dehydroacetate 926
Sodium desoxycholate O1134
Sodium diethyldithiocarbamate 212
Sodium dihydrophosphate 68
Sodium dioctyl sulfosuccinate ..... See Aerosol OT
Sodium diphenyl hydantoinate O1288
Sodium fluoride 69 (O74)
Sodium hydroxide O75
Sodium N-(2-hydroxymercuri-3-methoxypropyl)-2-pyridone-5-carboxylate 927
Sodium iodate 70
Sodium lauryl sulfate 213
Sodium molybdate 71
Sodium nitrate 72 (O76)
Sodium oxalate O77
Sodium pentachlorophenate ..... O352 and Add.
Sodium phenobarbital ..... See Sodium luminal
Sodium picrate O353
Sodium polyalkyl aryl sulphonate 437
Sodium selenate 73
Sodium selenite 74 (O78)
Sodium succinimido-aurate O79
Sodium succinyl sulfathiozole ..... See 2-(N^4-Succinyl-sulfanilamido)-thiazole, sodium salt
Sodium sulfate O80
Sodium sulfoethyl methyl oleamide 214
Sodium tungstate O81
Sorbitan monolaurate 928
Sorbitan monostearate 929
Span 20. ..... See Sorbitan monolaurate
Span 60. ..... See Sorbitan monostearate
Spartioidine O1329
Stannous fluoride 75
Stearic acid O187
Stearoyl ethyleneimine 930
Stearyl citrate 215
Stigmasterol 735

Stilbamidine O354
Stilbene 438 (O355)
Stilbestrol (stilboestrol; stilbesterol)..... See 4, 4'-Dihydroxy-α,β-diethylstilbene
Stilbestrol dipropionate ..... See 4, 4'-Dihydroxy-α,β-diethylstilbene dipropionate
Stilbestrol dimethylether ..... See 4, 4'-Dihydroxy-α,β-diethylstilbene dimethyl ether
Streptomycin 931 (O1289)
Streptomycin sulfate 932
Strontium (radioactive)..... O82
Strontium chloride..... 76
Strontium sulfate..... 77
Strophanthidin..... O1135
Strophanthin-K..... O1136
Styrene..... O356
Styryl 245 ..... O1290
Styryl 427 ..... O1291
Styryl 430 ..... O1292
4'-Succinoylamino-2,3'-dimethylazobenzene..... O1036
2-(N^4-Succinyl-sulfanilamido)-thiazole 933 (O1293)
2-(N^4-Succinyl-sulfanilamido)-thiazole, sodium salt O1294
Succinylsulfathiazole..... See 2-(N^4-Succinyl-sulfanilamido)-thiazole
Sucrose O1295
Sudan I 680 (O1037)
Sudan II 681 (O1038)
Sudan III 682 (O1039)
Sudan IV..... See Scarlet Red
Sudan Red II ..... See Sudan II
Sulfadiazine..... O1296
Sulfaethylthiazol, sodium salt O1297
Sulfaguanidine..... 439 (O357)
Sulfamerazine..... O1298
Sulfamethazine..... 934 (O1299)
Sulfamethylizole..... 935
Sulfamic acid..... O83
p-Sulfamidophenylazosalicylic acid, lithium salt..... O1040
Sulfanilamide..... 440 (O358)
6-Sulfanilamido-4, 6-dimethylpyrimidine... See Sulfamethazine
p-Sulfanilylamido-dimethylaniline O359
Sulfanyl guanidine..... See Sulfaguanidine
Sulfapyrazine..... O1300
Sulfapyridine 936 (O1301)
Sulfapyridine, sodium salt..... O1302
Sulfasuxidine ... See 2-(N^4-Succinyl-sulfanilamido)-thiazole
Sulfated butyl oleate 216
Sulfathiazole 937 (O1303)
Sulfathiazole, sodium salt O1304
10-Sulfhydrylmethyl-1,2-benzanthracene O745
Sulfosuccinic acid dioctyl ester, sodium salt .. See Aerosol OT
Sulphetrone 441
Sulphocholine chloride..... 217
Sunset Yellow 683

Tannic acid 978
Tartrazine 938
Taurine 218
Teflon 219
Tellurium dioxide..... 78
Terramycin..... See Oxytetracycline
Testosterone 736 (O1137)
Testosterone acetate..... O1138
Testosterone acetate 3-enolbenzoate..... O1139
Testosterone acetate 3-enol-n-butyrate..... O1140
Testosterone acetate 3-enolpropionate O1141
Testosterone benzoate..... O1142
Testosterone n-butyrate O1143
Testosterone n-butyrate 3-enolacetate O1144
Testosterone dipropionate..... See Testosterone enoldipropionate
Testosterone enoldipropionate O1145
Testosterone formate..... O1146
Testosterone isobutyrate O1147
Testosterone isobutyrate 3-enolacetate O1148
Testosterone isobutyrate 3-enolpropionate..... O1149
Testosterone propionate 737 (O1150)
Testosterone propionate 3-enolpropionate..... See Testosterone enoldipropionate
1,1,2,2-Tetrabromoethane..... 220
Tetrachlorethylene 221
Tetrachloro-p-benzoquinone..... O360
1,1,2,2-Tetrachloro-1,2-difluoroethane 222
1,1,1,2-Tetrachloro-2,2-difluoroethane 223
Tetrachloroethane O188
2,3,5,6-Tetrachloronitrobenzene 442
Tetracycline..... 565
Tetracyn..... See Tetracycline
Tetraethoxysilane..... See Tetraethyl orthosilicate
Tetraethylammonium chloride 224
Tetraethyl orthosilicate..... 225
Tetraethylthiuram disulfide..... 226
1',2',3',4'-Tetrahydro-4,10-ace-1,2-benzanthracene O919
2,3-Tetrahydrobenzanthracene..... See Tetrahydronaphthacene

1',2',3',4'-Tetrahydro-3,4-benzpyrene O920
1',2',3',4'-Tetrahydro-4,9-dimethyl-1,2-benzanthracene O746
1',2',3',4'-Tetrahydro-4,10-dimethyl-1,2-benzanthracene O747
1',2',3',4'-Tetrahydro-4-methyl-1,2-benzanthracene O748
1',2',3',4'-Tetrahydro-10-methyl-1,2-benzanthracene O749
5,6,7,8-Tetrahydro-10-methyl-1,2-benzanthracene.. O750
Tetrahydronaphthacene O751
Tetrahydronaphthalene 489 (O428)
1,2,3,4-Tetrahydro-α-naphthol 490
1,2,3,4-Tetrahydro-β-naphthol 491
1,2,3,4-Tetrahydro-2-naphthyl propionate 492
Tetralin. ..... See Tetrahydronaphthalene
Tetralin hydroperoxide 493
γ-(2-Tetralyl)-butyric acid O429
2,5,2',4'-Tetramethyl-4-aminoazobenzene O1041
Tetramethyl-p,p'-diaminoazoxybenzene O1042
2,3,6,7-Tetramethylanthracene O501
1,3,4,10-Tetramethyl-7,8-benzacridine 939 (O1305)
5,7,8,9-Tetramethyl-3,4-benzacridine.... See also 1,3,4,10-Tetramethyl-7,8-benzacridine
5,6,9,10-Tetramethyl-1,2-benzanthracene O752
Tetramethyl-p,p'-diaminobenzophenone O361
4,4'-Tetramethyldiaminodiphenyl 443
Tetramethyl-p,p'-diaminodiphenylmethane O362
Tetramethyl-p,p'-diaminotriphenylmethane O363
5,6-Tetramethylene-1,2,3,4-tetrahydro-8,9-acephenanthrene O922
Tetramethylnaphthacene O753
1,2,3,4-Tetramethylphenanthrene O502
Tetramethylthiourea 227
Tetramethylthiuram disulphide 228
Tetraphenylmethane O364
9,10,11,12-Tetraphenylnaphthacene O754
β-(2-Tetroyl)-propionic acid O430
Thallium O84
Theelin ..... See Estrone
Theelol ..... See Estriol
Therargidone ..... See Sodium N-(2-Hydroxymercuri-3-methoxypropyl)-2-pyridone-5-carboxylate
Thiamin O1306
Thioacetamide 229
2-Thiobarbituric acid O1307
p-Thiocresol O365
10-Thiocyano-1,2-benzanthracene O755
p-Thiocyanobenzoic acid 444
9-Thiocyano-10-methyl-1,2-benzanthracene O756
10-Thiocyanomethyl-1,2-benzanthracene O757
2,2'-Thiodiethanol diacetate 230
Thiodiglycol O189
1-Thioglycerol 231
1-Thioglycol 232
Thioglycolic acid 233
Thionaphtheno[2,3;3',2']thionaphthene 940
Thionaphtheno[4,5;4',5']thionaphthene 941
Thionine 942
Thionol ..... See Hydroxyphenthiazone
Thiouracil 943 (O1308)
2-Thiouracil-4-carboxylic acid 944
Thiourea 234 (O190)
Thonzylamine hydrochloride 945
Thorite O85
Thorium dioxide 79 (O86)
Thorotrast ..... See Thorium dioxide
Thymoquinone O366
Thyroxine 445 (O367)
Tibione ..... See p-Acetylaminobenzaldehyde thiosemicarbazone
TNT ..... See 2,4,6-Trinitrotoluene
α-Tocopherol O1309
dl-α-Tocopherol O1310
dl-α-Tocopherol acetate 946 (O1311)
o-Tolidine 446 (O368)
Toluene O369
o-Tolueneazo-β-naphthylamine ..... See 1-o-Tolylazo-2-naphthylamine
p-Tolueneazo-p-toluidine ..... See p-Aminoazotoluene
Toluidine O374
m-Toluidine 447 (O370)
o-Toluidine 448 (O371)
o-Toluidine hydrochloride O372
p-Toluidine O373
Toluidine Blue 947
m-Toluylenediamine O375
p-Toluylenediamine O376
o-Tolylazo-β-naphthol 684 (O1044)
1-o-Tolylazo-2-naphthylamine 685 (O1043)
2-(N-p'-tolyl-N-(m'-hydroxyphenyl)-aminomethyl)-imidazoline 948
Triacetin O191
Triacetyl diphenyl isatin 949
Tri-p-anisylchloroethylene 449
Triarachidin O192
Triarachin ..... See Triarachidin
1,2,3,4,5,6-Tribenzanthracene O948
Tribromo-3,4-benzpyrene O921
2',4',6'-Tribromo-4-dimethylaminoazobenzene 686

Tributyrin 235 (O193)
Tricaprin O194
Tricaprylin 236 (O195)
Tricerotin O196
Trichloracetic acid O197
2',4',6'-Trichlor-4-dimethylaminoazobenzene 687
β,β,β-Trichlorethyl carbamate O1334
10-Trichloracetyl-1,2-benzanthracene O758
Trichloroacetonitrile 237
1,1,1-Trichloro-2,2-bis(p-chlorophenyl) ethane O377
1,1,1-Trichloroethane 238
β,β,β-Trichloroethyl carbamate 239
Trichloroethylene 240 (O198)
2,4,5-Trichlorophenoxyacetic acid 450
Tri-o-cresyl phosphate 451
Triethylamine 241
Triethylene glycol O199
2,4,6-Tri-(ethyleneimine)-1,3,5-triazine ..... See Triethylene melamine
Triethylene melamine 950
2',4',6'-Trifluoro-4-dimethylaminoazobenzene 688
2'-Trifluoromethyl-4-dimethylaminoazobenzene 689
3'-Trifluoromethyl-4-dimethylaminoazobenzene 690
4'-Trifluoromethyl-4-dimethylaminoazobenzene 691
Trigentisic acid 979
Tri-p-hydroxybenzoic acid 980
Trihydroxyoestrin ..... See Estriol
Trilaurin O200
Trilinolein O201
2,7,9-Trimethylacridine O1312
2,9,10-Trimethylanthracene O503
1,2,3-Trimethyl-4-azaphenanthrene O1313
5,7,9-Trimethyl-1,2-benzacridine ..... See 1,3, 10-Trimethyl-5,6-benzacridine
1,2,10-Trimethyl-5,6-benzacridine 951
5,7,9-Trimethyl-3,4-benzacridine ..... See 1,3, 10-Trimethyl-7,8-benzacridine
1,3,10-Trimethyl-5,6-benzacridine 952 (O1314)
1,4,10-Trimethyl-5,6-benzacridine 953
1,10,3'-Trimethyl-5,6-benzacridine 954
2,3,10-Trimethyl-5,6-benzacridine 955
2,4,10-Trimethyl-5,6-benzacridine 956
1,3,10-Trimethyl-7,8-benzacridine 957 (O1315)
1,4,10-Trimethyl-7,8-benzacridine 958
1,6,10-Trimethyl-7,8-benzacridine 959
2,3,10-Trimethyl-7,8-benzacridine 960
5,9,10-Trimethyl-1,2-benzanthracene 566 (O759)
6,9,10-Trimethyl-1,2-benzanthracene O760
3',3,9-Trimethylcyclopentenophenanthrene O761
3',3',9-Trimethylcyclopentenophenanthrene 567
2,2,4-Trimethyl-1,2-dihydrofluoranthene O762
1,12-Trimethylenechrysene 576 (O923)
Trimethylene glycol O202
2,3,4-Trimethylfluoranthene O763
Trimethylolmelamine 961
1,2,4-Trimethylphenanthrene 529
2,3,?-Trimethylphenanthrene O504
2,2,4-Trimethyl-1,2,3,4-tetrahydrofluoranthene O764
2',5',7-Trimethyl-3',4',1,2-thiophenocarbazole 962
5',5,8-Trimethyl-3',2',1,2-thiophenocarbazole 963
Trimyristin O203
2,4,6-Trinitrotoluene 452 (O378)
Triolein O204
Trioxane 964
Tripalmitin O205
α,α,β-Triphenyl-α-butylene ..... O380 and Add.
Triphenylene O765
s-Triphenylbenzene O379
Triphenylcarbinol O381
Triphenylchlorethylene O382
Triphenylethylene 453 (O383)
Tris(β-chloroethyl)amine 242
Tris(β-chloroethyl)amine hydrochloride 243
Tristearin O206
Trivalerin O207
Tromexan 965
Truxene O949
Trypaflavine 966
Trypan Blue 692
Tungsten O87
Tungstic oxide O88
Tween 20. ....See Polyoxyethylene sorbitan monolaurate
Tween 60. ..... See Polyoxyethylene sorbitan monostearate
Tyramine O384
Tyrosine 454
Undecylenic acid 244
Uraninite (pitchblende) O89
Urea O208
Urethane ..... See Ethyl carbamate
Vaccenic acid 245
γ-Valerolactone O209
Vanadium pentoxide 80
Vinyl chloride polymer 246
Vinylcyclohexane dioxide 967
Vinyl propionate 247
Viomycin 981

Vital Red 693
Vitamin A 455
Vitamin B^{12} 982
Vitamin D_2 ..... See Calciferol
Vitamin D_3 ..... O431
Vitamin E ..... See α-Tocopherol
Vitamin K_1, synthetic O432
W-53 ..... See N-(2-Pyridyl)-N-(2-thenyl)-N',N'-dimethylethylenediamine
Water O90
Xanthene O1316
Xanthone O1317
Xanthotoxin 968
Xylene O385
Xylidine (mixed isomers) 456
Xylose O1318
Yellow AB ..... See Phenylazo-2-naphthylamine
Yellow OB ..... See 1-o-Tolylazo-2-naphthylamine
Yttrium (radioactive) O91
Yttrium phosphate O92
Yohimbine hydrochloride O1319
Zinc (form not stated) 81 (O93)
Zinc acetate O94
Zinc beryllium silicate 82
Zinc carbonate O95
Zinc chloride 83 (O96)
Zinc citrate O97
Zinc dimethyldithiocarbamate 248
Zinc ethylene-bisdithiocarbamate 249
Zinc lactate O98
Zinc d-lactate O99
Zinc dl-lactate O100
Zinc malate O101
Zinc nitrate 84 (O102)
Zinc oxide O103
Zinc phosphide 85
Zinc silicate 86
Zinc sulfate 87 (O104)
Zirconium carbonate 88
Zirconium chloride 89

Numbers refer to compound numbers. Oral omitted

Implantation 39, 58, 63, 332, 334, 337, 361, 389, 424, 477
Inhalation (and nasal insufflation) 1, 11, 13, 16, 18, 19, 20, 22, 24, 41, 52, 55, 56, 106, 107, 111, 113, 123, 126, 128, 136, 137, 148, 150, 152, 155, 156, 173, 178, 182, 189, 194, 208, 220, 221, 225, 226, 228, 237, 238, 240, 241, 260, 278, 296, 298, 307, 313, 324, 405, 456, 758
Intramuscular 171, 179, 183, 224, 254, 274, 278, 282, 296, 329, 332, 338, 387, 388, 393, 534, 542, 564, 568, 570, 575, 582, 706, 707, 709, 714, 718, 734, 737, 784, 853, 931, 975, 976, 981
Intraperitoneal 27, 61, 62, 69, 99, 105, 118, 119, 120, 124, 125, 130, 132, 133, 138, 143, 144, 145, 147, 152, 153, 158, 159, 162, 168, 176, 181, 186, 187, 188, 190, 191, 195, 197, 200, 201, 210, 219, 232, 242, 265, 304, 311, 313, 320, 323, 347, 348, 360, 362, 403, 506, 514, 575, 596, 634, 693, 705, 706, 754, 757, 796, 832, 880, 885, 901, 902, 903, 904, 905, 909, 950, 961, 967, 982
Intratracheal 13
Intravenous 8, 13, 14, 15, 33, 47, 59, 60, 79, 82, 86, 88, 108, 109, 114, 116, 117, 123, 152, 164, 165, 170, 179, 185, 186, 224, 242, 276, 296, 318, 542, 568, 570, 575, 700, 764, 827, 843, 852, 853, 854, 886, 887, 888, 909, 913, 917, 925, 942, 947

SITE OF APPLICATION INDEX

Numbers refer to compound numbers
Skin (direct application) and subcutaneous tissue omitted

Abdomen 58, 63, 79, 568, 570, 575
Allantoid cavity 568, 575
Anus 570
Back 542, 568, 570
Bladder 458, 477, 791
Bone 53, 542, 568, 575
Bone marrow 542, 570
Brain 569, 575
Breast 568, 570, 575
Buttock 570
Cervical canal 575
Coagulating gland 575
Comb 568, 736
Ear 86, 542, 568, 570, 575
Eye 149, 569
Flank 568, 570
Gall bladder 575, 700
Gastric mucosa 202, 497, 534, 575
Gum 542
Inguinal fold 542
Kidney 542, 575
Lip 542, 570
Liver 575
Lung 53, 393, 575
Lymph nodes 542
Mammary gland 542, 568, 570, 575
Mandible cavity 542
Omentum 575
Ovary 568
Parotid gland 534, 542, 570, 575
Preening gland 347, 570, 575, 790
Prostate 575
Rectal mucosa 575
Scrotum 568, 570
Shell 568
Sinus
  Nasal 53
Skin (Intradermal) 10, 35, 36, 37, 42, 43, 44, 66, 100, 123, 141, 142, 152, 163, 185, 279, 285, 286, 289, 291, 299, 331, 363, 375, 376, 413, 458, 460, 493, 542, 568, 591, 630, 705, 757, 761, 796, 911, 931, 950
Spleen 512, 513, 542, 575, 618, 713
Stomach 534, 568
Submaxillary gland 570
Tail 575
Testis 542, 575
Thigh 568, 716
Thorax 713
Thymus 542, 568, 570
Tongue 568
Uterus 568, 575
Vagina 568, 575
Visceral sac 270
Wattle 568

SPECIES INDEX

Numbers refer to compound numbers.

Mollusks
- Cuttlefish 570
- Snail 568

Insects
- Cockroach 575

Amphibians and Reptiles
- Frog 568,575
- Salamander (Newt) 12, 497, 568, 575, 679

Birds
- Duck 91, 312, 359, 575, 737
- Fowl (domestic) 16, 67, 83, 131, 139, 152, 157, 183, 296, 332, 333, 337, 347, 352, 542, 568, 570, 575, 582, 700, 714, 736, 746, 790, 820, 910, 943
- Goose 700
- Pigeon 575, 734

Mammals
- Cat 11, 13, 16, 19, 26, 55, 89, 106, 117, 194, 296, 332, 405, 416, 456, 564, 793, 975, 981
- Cow 45, 46, 48, 49
- Dog 9, 11, 13, 16, 19, 20, 22, 24, 50, 52, 60, 74, 96, 106, 107, 108, 109, 114, 161, 164, 172, 175, 178, 179, 183, 184, 191, 192, 208, 215, 219, 224, 226, 248, 249, 252, 259, 265, 271, 280, 281, 282, 283, 286, 288, 293, 295, 296, 298, 317, 318, 325, 327, 329, 330, 332, 340, 346, 351, 364, 367, 370, 372, 382, 383, 384, 416, 422, 430, 436, 444, 446, 450, 476, 477, 486, 487, 497, 564, 565, 582, 618, 700, 706, 709, 746, 770, 785, 786, 809, 828, 832, 849, 852, 853, 868, 876, 877, 878, 884, 901, 902, 903, 904, 905, 927, 943, 945, 948, 949, 974, 975, 976, 981
- Ferret 699
- Goat 16
- Guinea pig 1, 16, 19, 20, 28, 45, 48, 56, 62, 69, 74, 107, 131, 137, 148, 152, 155, 156, 157, 169, 178, 182, 194, 208, 220, 221, 225, 237, 238, 240, 265, 268, 292, 302, 306, 309, 313, 330, 332, 334, 335, 338, 339, 352, 377, 385, 389, 392, 417, 418, 429, 430, 456, 485, 491, 511, 512, 513, 521, 542, 568, 570, 575, 694, 696, 698, 700, 706, 713, 714, 715, 718, 724, 725, 729, 733, 736, 758, 760, 773, 793, 820, 832, 849, 883, 889, 895, 901, 902, 904, 905, 912, 922, 931, 932, 933, 968, 970, 971, 972, 973, 979, 980, 982
- Hamster 16, 69, 75, 203, 332, 477, 513, 543, 618, 700, 713, 720, 724, 907, 912, 928
- Horse 45
- Man 332, 908, 929

Mammals--(Continued)
- Man--(Continued)
- Monkey 13, 16, 53, 54, 107, 148, 155, 156, 182, 194, 237, 238, 240, 296, 326, 327, 332, 373, 405, 449, 456, 542, 568, 570, 575, 700, 706, 708, 718, 734, 736, 737, 760, 786, 787, 789, 839, 849, 852, 871, 926
- Mouse (names strains only)
  - VI 568
  - VII 568
  - IX 568
  - X 542
  - XVII 107, 123, 535, 540, 738, 739, 740, 741, 742, 743, 744, 745, 765, 769, 774, 775, 781, 791, 800, 801, 807, 811, 812, 814, 815, 816, 818, 821, 822, 823, 824, 838, 840, 841, 858, 859, 860, 862, 865, 866, 869, 870, 872, 874, 876, 881, 882, 892, 939, 952, 954, 957, 962, 963
  - XVIII 533
  - A 37, 99, 107, 112, 120, 123, 132, 138, 143, 145, 152, 153, 159, 174, 176, 185, 186, 187, 188, 207, 210, 234, 239, 362, 393, 440, 453, 497, 506, 542, 568, 570, 575, 582, 700, 714, 734, 737, 912, 936, 937, 943, 950
  - ABC (A, backcross) 100, 173, 185, 234, 289, 568, 570, 575, 582
  - AC_3 575
  - AF_1 734
  - A_2G 258, 412
  - A/JAX 152, 162
  - AK 575
  - AKA 737, 937
  - B 42, 123, 185, 291, 376, 458, 591, 705, 757, 761, 916, 931
  - Bagg 152
  - Bagg Albino 715
  - BALB 575
  - BALB/C 715
  - BI 582
  - BIC 332, 711, 712, 714, 718
  - BIH 332, 539, 543, 544, 547, 548, 556, 557, 558, 560, 562, 567, 711, 712, 714, 718, 719
  - BL 575
  - Broto MAO 737
  - C 152, 296, 332, 393, 542, 568, 570, 575, 582, 679, 714, 737, 943

Mammals--(Continued)
Mouse (name strains only)--Continued
C_3H 28, 107, 113, 123, 152, 173, 184, 186, 208, 234, 278, 332, 440, 506, 542, 568, 570, 575, 582, 605, 700, 707, 714, 718, 734, 737, 936, 937, 943, 982
C57 10, 28, 66, 141, 163, 234, 279, 413, 440, 449, 460, 507, 542, 549, 568, 570, 575, 582, 700, 714, 734, 737, 761, 911, 936, 937, 943, 982
C57 black 152, 173, 236, 506, 534, 538, 566, 575, 582, 605, 718
C57 brown 575
CAF_1 534, 541, 551, 552, 553, 568, 571
CBA 42, 152, 185, 304, 332, 375, 449, 477, 506, 573, 574, 575, 610. 709, 714, 715, 716, 734, 737, 791, 836, 950
CC_1 575
CD 774, 776, 840, 857
CF_1 28, 522, 538, 571, 572, 575, 982
CFW 570, 575
D 737
DB_2 575
dba (including Little dilute brown, Murray-Little dba, etc.) 27, 28, 69, 152, 477, 542, 566, 568, 575, 582, 714, 718, 719, 734, 982
Dobrovolskaya-Zavadskaya 568
DWF 575
FA 152
FAK 37
FAK IX 44, 363
FB 152
GFF 579, 641
Hairless 570
Harlan 92, 110, 127, 196, 216, 314, 321, 365, 391, 404, 488
hr hr (haired and hairless) 575
Hybrid 152, 332, 348, 714, 734, 737
I 575, 943
IF 477, 575
JAX 568
JK 575
L 577
M 568
MRC 575, 700
MRC/H 568, 570
N 575
NA 152
New Zealand white 107
NH 575, 715, 737
NLC 533

Mammals--(Continued)
Mouse (named strains only)--Contineud)
Parkes 568
PBr 575
PM 575
Prunt 575
R3 234, 719
RIII 458
RIIX 575
R3A 464
R3P 464
RAP 173, 278, 570, 575
Rfc 935
Rfl 935
RIL 332
Rockland 152, 564, 568, 575
R-U 576
S 542
Scott Hooded 412
Simpson 582, 583, 584, 586, 587
St/Eh 705
Street 542, 568, 570, 575
Strong A 791
SW 471, 837
Swiss 152, 184, 185, 186, 242, 243, 497, 514, 542, 564, 568, 570, 575, 737, 767, 819, 824, 940, 941, 950
SWR 570
WA 575
WXA 152
Y 575
Mouse (field) 157
Pig 8, 13, 16, 332
Rabbit 2, 3, 4, 5, 6, 7, 8, 11, 13, 14, 15, 16, 19, 20, 21, 23, 26, 30, 32, 33, 34, 40, 45, 47, 52, 59, 65, 68, 69, 70, 71, 74, 79, 81, 82, 84, 86, 87, 90, 93, 94, 95, 98, 106, 107, 116, 117, 128, 131, 148, 149, 150, 152, 155, 156, 164, 165, 168, 170, 171, 175, 177, 179, 182, 186, 194, 202, 215, 220, 221, 226, 228, 231, 237, 238, 240, 241, 252, 265, 274, 278, 286, 292, 296, 298, 302, 307, 316, 313, 319, 324, 337, 352, 356, 357, 358, 452, 456, 460, 477, 491, 497, 507, 527, 534, 542, 569, 570, 575, 679, 700, 705, 706, 709, 716, 724, 737, 756, 758, 764, 784, 794, 795, 805, 820, 827, 843, 849, 854, 883, 886, 887, 888, 903, 909, 913, 917, 925, 932, 942, 947, 970, 971, 972, 973, 979, 980
Rat (named strains only)
AES 104, 151, 235, 497
August 332

Mammals--(Continued)
Rat (named strains only)--(Continued)
AXC 332, 517, 568, 575, 718
BDI 62, 105, 201, 251, 254, 341, 342, 353, 354, 355, 414, 424, 468, 577, 581, 589, 614, 685
BDIII 622, 251, 254, 270, 341, 342, 344, 353, 354, 355, 414, 424, 577, 581, 589, 614, 685
Black Hooded 718
Buffalo 497, 526
Carworth 370, 537, 713, 733, 792, 912
CFW 234
Comentry 253, 263
Copenhagen 332, 718
Dow 301, 312, 357, 358
Fischer 332, 497, 568
Hairless 393, 465
Heterozygotic 578, 593, 594, 595, 603, 617, 628, 631, 680
Hisaw 78
Holtzman 69, 254, 255, 256, 495, 497, 500, 501, 502, 503, 506, 520, 523, 526, 531, 532, 611, 612, 618, 635, 636, 637, 638, 688, 706, 709, 714, 737, 747, 748, 750, 753
Hooded 497, 692
Hybrid 393, 465
K 912
Lister Hooded 497, 883
Long Evans 69, 166, 234, 332, 497, 575, 581, 618, 697, 704, 705, 706, 709, 713, 723, 731, 733, 736
Magman 197
Marshall 568, 575
Minnesota 497, 506, 517, 526
Osborne Mendel 53, 92, 213, 214, 259, 281, 284, 368, 393, 406, 423, 427, 434, 436, 527, 575, 618, 621, 622, 782, 924
Piebald 202, 332, 477, 497, 520, 525, 575, 708
PVG 575
Rochester 161, 248
Rockland 217
Royal Victoria Hospital 497
Saitama 923
Scott Hooded 258, 579, 641
Sherman 98, 137, 148, 167, 202, 225, 232, 260, 286, 287, 288, 330, 360, 446, 497, 564, 590, 592, 609, 610, 618, 627, 642, 660, 663, 665, 666, 713, 734, 914, 915, 943
Slonaker 331
Sprague-Dawley 32, 61, 67, 103, 107, 126, 149, 180, 197, 203, 204, 244, 266, 267, 273, 286, 296, 315, 322, 382, 409, 455, 497, 515, 516, 518, 537, 542, 550, 575, 581, 590, 597, 599, 600, 601, 610, 618, 623, 624, 625, 626, 632, 633, 639, 643, 644, 650, 651, 653, 655, 656, 657, 658, 659, 664, 665, 670, 671, 705, 709, 790, 798, 808, 907, 914, 915, 928, 943
Sprague-Dawley Holtzman 497, 506, 508, 509, 510, 588, 606, 616, 620, 645, 647, 648, 649, 654, 658
Stanford 497, 943
Swiss 332
Taby 497
W 851
Wistar 39, 58, 62, 63, 76, 80, 101, 126, 147, 152, 156, 163, 168, 186, 201, 202, 221, 225, 226, 232, 234, 240, 246, 250, 254, 257, 268, 275, 276, 280, 281, 282, 284, 293, 294, 296, 300, 332, 338, 364, 374, 379, 386, 389, 395, 403, 408, 414, 422, 424, 497, 506, 514, 520, 524, 525, 526, 534, 536, 554, 574, 575, 580, 581, 596, 602, 610, 618, 634, 653, 655, 658, 667, 673, 674, 676, 677, 678, 679, 681, 682, 683, 684, 685, 692, 693, 702, 705, 709, 713, 714, 723, 737, 754, 757, 787, 833, 835, 842, 844 852, 853, 862, 873, 880, 883, 900, 912, 918, 923, 934, 937, 938, 943

TUMOR SITE INDEX

Numbers refer to compound numbers. Skin omitted.

Abdomen 62, 104, 105, 298, 304, 332, 334, 521, 709, 715
Acoustic ducts 270, 497, 506, 575
Adrenal 249, 332, 709, 715, 718, 737
Bladder 254, 262, 271, 286, 331, 332, 343, 458, 477, 497, 506, 523, 575, 618, 718, 791
Blood 152, 185, 242, 258, 282, 332, 412, 458, 497, 502, 517, 534, 542, 568, 570, 573, 574, 575, 581, 582, 618, 622, 668, 715, 937, 861
Bile duct 581, 618
Bone 8, 15, 82, 185, 201, 207, 242, 345, 542, 568, 575
Bone marrow 53
Brain 495, 497
Breast 332, 372, 393, 497, 520, 542, 575, 603, 617, 631, 669, 837
Bronchus 506, 575
Cervix 575, 714
Colon 331, 498, 502, 520
Ear 254, 286, 288, 304, 332, 343, 345, 446, 495, 497, 501, 502, 503, 517, 520, 523, 525, 531, 542, 575, 590, 642, 750, 751, 752
Eye 332, 497
Eyelid 497
Forearm 344
Forestomach 235, 331, 508, 509, 510, 526, 542, 570, 575, 621, 654, 668, 846
Gall bladder 575, 582
Groin 304
Head 497
Inguinal region 668
Intestine 249, 256, 304, 345, 497, 495, 502, 503, 520, 523, 750, 751
Kidney 264, 332, 513, 575, 587, 713, 937
Liver 107, 123, 152, 208, 234, 264, 286, 288, 304, 331, 332, 347, 368, 458, 477, 497, 500, 501, 506, 513, 517, 520, 523, 525, 526, 532, 542, 573, 575, 581, 582, 584, 585, 586, 587, 599, 600, 601, 611, 612, 613, 618, 621, 622, 623, 627, 632, 634, 635, 638, 640, 653, 656, 658, 660, 662, 663, 664, 665, 666, 668, 670, 671, 679, 680, 688, 692, 713, 720, 788, 791, 836, 977, 978
Lumbar region 87
Lung 79, 99, 112, 122, 123, 124, 125, 132, 138, 143, 145, 152, 153, 159, 162, 173, 174, 176, 185, 186, 187, 188, 207, 210, 234, 239, 242, 243, 249, 304, 332, 334, 347, 372, 477, 503, 514, 520, 525, 526, 535, 542, 568, 570, 573, 574, 575, 576, 582, 617, 622, 658, 662, 680, 811, 814, 874, 935, 943, 950, 952, 957
Lymph nodes 79, 123, 152, 334, 568, 692
Mammary gland 123, 234, 249, 254, 256, 264, 282, 298, 304, 332, 343, 345, 453, 464, 497, 500, 501, 503, 506, 517, 523, 525, 526, 532, 539, 542, 548, 558, 567, 568, 570, 575, 576, 621, 711, 712, 713, 714, 718, 719, 734, 747, 749, 750, 751, 752
Neck 304, 568, 831
Ovary 298, 332, 497, 506, 542, 653, 719, 734
Pancreas 298, 332, 589, 618, 685, 713, 718
Paw 576
Peritoneum 79, 334, 520, 568, 575, 714
Pituitary 332, 334, 370, 506, 575, 618, 718, 912
Pleura 53, 668
Pylorus 714
Rib 796
Salivary gland 345, 542, 568, 570, 575
Sebaceous gland 568
Seminal vesicle 497
Sinus
  Nasal 53
Spleen 79, 618
Stomach 575, 581, 791, 814, 846
Submaxillary gland 304
Testis 372, 449, 453, 542, 796
Thorax 332, 334, 521, 575, 668
Thymus 497, 542, 562, 719
Thyroid 234, 249, 332, 347, 497, 576, 883, 912, 943
Tongue 568
Uterus 264, 304, 332, 334, 338, 339, 393, 495, 487, 503, 512, 513, 523, 568, 575, 576, 589, 685, 713, 719
Vagina 575, 714

VEHICLE INDEX

NUMBERS REFER TO COMPOUND NUMBERS.

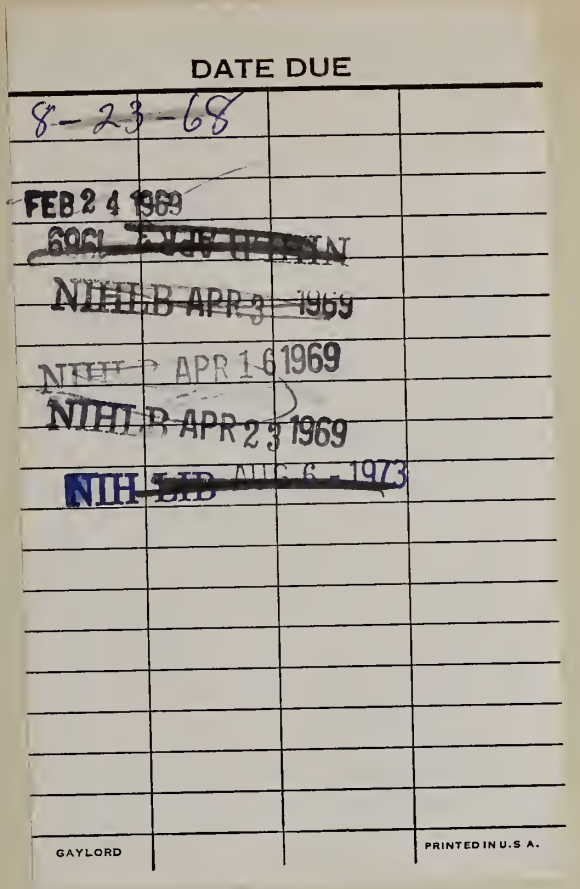
Acetone 123, 152, 254, 258, 282, 460, 497, 506, 517, 522, 526, 533, 535, 538, 540, 542, 568, 570, 571, 572, 573, 574, 575, 607, 618, 713, 734, 736, 778, 780, 791, 796, 810, 836, 863, 899, 951, 953, 955, 956, 958, 959, 960
Alcohol 149, 254, 258, 412, 542, 575, 579, 641, 704, 705, 713, 718, 723, 736
Amyl acetate 497, 506, 508, 509, 510, 588, 606, 616, 645, 654
Beeswax 172, 534, 570
Benzene 289, 477, 506, 529, 539, 542, 543, 544, 545, 546, 547, 548, 556, 557, 558, 559, 560, 561, 562, 563, 566, 567, 568, 570, 574, 575, 582, 622, 701, 702, 709, 712, 719, 732, 766, 767, 819, 824, 890, 891, 940, 941
Butyl succinate 642
Capsule 161, 184, 248, 295, 325, 370, 450, 570, 575, 700, 770, 786, 795, 798, 828, 849, 974
  Gelatin 280, 281, 282, 283, 286, 288, 327, 330, 351, 364, 700, 809
Carbowax 542, 575
Chloroform 718
Cholesterol 332, 338, 568, 570, 575, 715, 716
Crystals 286, 334, 497, 506, 512, 513, 521, 528, 542, 555, 568, 570, 575, 582, 700, 709, 713, 718, 968
Dioxane 514, 542, 575
Emulsion 501, 542
Ether 575
Eugenol 506, 508, 510, 575
Fat
  Chicken 296, 542, 570
  Rabbit 542
Film 246
Film disc 105, 201, 424
Food 4, 21, 28, 29, 31, 32, 34, 38, 47, 53, 54, 61, 67, 69, 71, 73, 78, 80, 85, 89, 92, 98, 103, 104, 107, 121, 134, 139, 151, 152, 154, 160, 161, 164, 165, 167, 175, 180, 203, 204, 205, 206, 209, 213, 214, 215, 217, 281, 226, 227, 229, 231, 233, 234, 235, 244, 245, 247, 248, 249, 250, 253, 254, 255, 256, 257, 259, 261, 262, 263, 266, 267, 268, 271, 273, 275, 281, 282, 284, 288, 290, 293, 294, 296, 297, 298, 300, 301, 305, 306, 312, 315, 322, 330, 331, 332, 333, 337, 343, 346, 349, 358, 359, 366, 367, 368, 370, 371, 372, 374, 379, 382, 383, 384, 389, 393, 395, 398, 399, 406, 408, 409, 410, 412, 416, 422, 423, 425, 427, 430, 434, 435, 436, 437, 439, 440, 441, 442, 447, 448, 451, 452, 457, 462, 463, 466, 467, 468, 469, 470, 471, 472, 473, 474, 476, 477, 478, 479, 480, 482, 483, 484, 485, 489, 490, 491, 492, 494, 495, 496, 497, 498,
Food--(Continued)
499, 500, 501, 502, 503, 506, 515, 516, 517, 518, 519, 520, 523, 525, 526, 527, 530, 531, 532, 533, 537, 550, 570, 575, 578, 580, 581, 582, 583, 584, 590, 593, 594, 595, 597, 598, 599, 600, 601, 602, 603, 604, 607, 608, 609, 610, 611, 612, 613, 617, 618, 619, 621, 622, 623, 624, 625, 626, 627, 628, 629, 631, 632, 633, 635, 636, 637, 638, 639, 640, 643, 644, 646, 647, 648, 649, 650, 651, 653, 655, 656, 657, 658, 659, 660, 663, 664, 665, 666, 667, 668, 669, 670, 671, 672, 673, 674, 675, 676, 677, 678, 679, 680, 681, 682, 683, 684, 685, 686, 687, 688, 695, 699, 700, 702, 703, 726, 727, 728, 730, 731, 733, 736, 746, 747, 748, 749, 750, 751, 752, 753, 754, 760, 770, 782, 785, 787, 789, 792, 805, 808, 830, 833, 835, 842, 844, 845, 848, 852, 862, 868, 873, 883, 884, 894, 895, 900, 907, 910, 912, 913, 914, 915, 918, 920, 921, 923, 924, 928, 932, 933, 938, 946, 949, 964, 974, 976, 982
Glyceryl monoricinoleate 542
Gum
  Arabic 61, 481, 497, 883
Serum
  Horse 570, 575
Isopropyl alcohol 258, 412
Lanolin 53, 393, 420, 542, 568, 575
Lard 382, 440, 568, 570, 575, 582, 658, 700, 936
Margarine 297
Milk 13, 152, 319
Oil
  Almond 107, 390, 575
  Cod liver 658, 700
  Colza 568
  Corn 107, 295, 360, 570, 658
  Croton 123, 152, 460, 506, 534, 542, 568, 575, 607, 618, 707, 713, 736
  Linseed 700
  Mineral 107, 123, 534, 541, 542, 551, 552, 553, 568, 570, 571, 575, 618
  Olive 107, 123, 278, 286, 287, 288, 296, 312, 357, 378, 407, 446, 475, 477, 481, 497, 527, 534, 542, 568, 570, 575, 576, 582, 590, 592, 642, 679, 700, 707, 709, 714, 737, 763, 787, 811, 812, 814, 815, 816, 874, 939, 952, 957, 966
  Paraffin 713, 736
  Peach 507, 534, 542, 549, 568
  Peanut (Arachis) 123, 141, 142, 189, 251, 258, 264, 291, 296, 299, 304, 328, 331, 332, 345, 347, 363, 375, 376, 412, 431, 453, 458, 460, 477, 493, 497, 506, 520, 525,

Oil--(Continued)
Peanut (Arachis)--Continued
533, 542, 568, 570, 575, 579, 607, 610, 641, 680, 702, 714, 715, 718, 734, 737, 738, 739, 740, 741, 742, 743, 744, 745, 765, 769, 774, 775, 776, 781, 791, 796, 797, 800, 801, 807, 810, 813, 817, 818, 821, 822, 823, 829, 836, 838, 840, 841, 857, 858, 859, 860, 861, 863, 864, 865, 866, 869, 870, 872, 876, 881, 882, 892, 896, 897, 898, 899, 930, 951, 953, 955, 956, 958, 959, 960, 962, 963, 967, 977
Sesame 332, 334, 337, 449, 539, 544, 547, 556, 557, 558, 562, 567, 568, 570, 575, 582, 700, 709, 711, 712, 714, 715, 717, 718, 719, 733, 734, 737
Soya 568
Sunflowerseed 542, 568, 570, 575, 934
Unspecified 568, 570, 575, 719, 737, 837, 954
Wesson 107
Paraffin 282, 332, 334, 347, 389, 458, 477, 507, 513, 534, 542, 568, 569, 570, 575, 618, 694, 696, 699, 700, 706, 708, 713, 715, 716, 718, 720, 725, 729, 733, 734, 736, 737, 790, 791
Polyethylene glycol 575, 622
Propylene glycol 123, 197, 237, 252, 338, 356, 386, 405, 497, 755
Oil--(Continued)
Pyrax 296
Sodium myristyl sulfate 542
Sodium oleate 542
Thread impregnation 534, 575
Tricaprylin 99, 120, 132, 138, 145, 152, 153, 159, 176, 187, 210, 362, 506, 534, 538, 542, 554, 568, 570, 573, 574, 575, 767, 791, 819, 824, 836, 940, 941
Triton N & NE 542
Vaseline (petrolatum, pomade) 568, 570, 575, 679
Water 2, 3, 4, 5, 6, 7, 8, 10, 11, 12, 13, 14, 15, 16, 17, 23, 25, 26, 27, 28, 31, 34, 35, 36, 37, 40, 42, 43, 44, 45, 48, 50, 56, 60, 62, 65, 66, 68, 69, 72, 74, 75, 76, 77, 82, 84, 86, 88, 90, 95, 96, 97, 100, 106, 116, 122, 123, 129, 132, 141, 143, 149, 152, 162, 163, 165, 166, 172, 177, 184, 185, 186, 188, 197, 198, 202, 231, 232, 234, 243, 258, 260, 272, 277, 279, 285, 289, 331, 332, 335, 346, 364, 412, 413, 421, 432, 433, 445, 452, 475, 477, 497, 506, 514, 542, 570, 575, 579, 591, 605, 630, 641, 693, 705, 706, 708, 736, 757, 758, 759, 761, 764, 768, 777, 795, 798, 843, 849, 854, 883, 884, 887, 888, 909, 911, 912, 916, 923, 925, 926, 931, 943, 942, 947, 948, 950, 975, 978, 981
Xylene 575, 795

☆ U. S. GOVERNMENT PRINTING OFFICE : 1957 O—443895

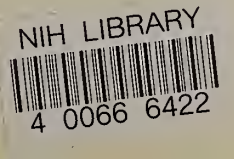
...tes of Health
...nd

Library
National Institutes of Health
Bethesda 14, Maryland



LIBRARY
NIH
Amazing Research.
Amazing Help.
http://nihlibrary.nih.gov

10 Center Drive
Bethesda, MD 20892-1150
301-496-1080



NIH LIBRARY
3 1496 00184 7196